

**UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY
TRENTON VICINAGE**

ASSOCIATION OF NEW JERSEY
RIFLE & PISTOL CLUBS, INC.,
BLAKE ELLMAN, and ALEXANDER
DEMBOWSKI,

Plaintiffs,

v.

GURBIR GREWAL, in his official
capacity as Attorney General of New
Jersey, PATRICK J. CALLAHAN, in
his official capacity as Superintendent
of the New Jersey Division of State
Police, THOMAS WILLIVER, in his
official capacity as Chief of Police of
the Chester Police Department, and
JAMES B. O'CONNOR, in his official
capacity as Chief of Police of the
Lyndhurst Police Department,

Defendants.

Hon. Peter G. Sheridan, U.S.D.J.
Hon. Lois H. Goodman, U.S.M.J.

Docket No. 3:18-cv-10507-PGS-LHG

**DECLARATION OF JOHN J.
DONOHUE**

I, John J. Donohue, am competent to state, and declare the following, based on my personal knowledge:

1. I am a citizen of the United States and a resident of California.
2. I am over 21 years of age.

BACKGROUND AND QUALIFICATIONS

3. I am the C. Wendell and Edith M. Carlsmith Professor of Law at Stanford Law School. (A copy of my complete C.V. is attached as Exhibit A.) After

earning a law degree from Harvard and a Ph.D. in economics from Yale, I have been a member of the legal academy since 1986. I have previously held tenured positions as a chaired professor at both Yale Law School and Northwestern Law School. I have also been a visiting professor at a number of prominent law schools, including Harvard, Yale, the University of Chicago, Cornell, the University of Virginia, Oxford, Toon University (Tokyo), St. Gallens (Switzerland), and Renmin University (Beijing).

4. For a number of years I have been teaching at Stanford a course on empirical law and economics issues involving crime and criminal justice, and I have previously taught similar courses at Yale Law School, Tel Aviv University Law School, the Gerzensee Study Center in Switzerland, and St. Gallen University School of Law in Switzerland. Since gun crime is such an important aspect of American criminal justice, my courses evaluate both the nature of gun regulation in the United States and the impact of gun regulation (or the lack thereof) on crime, which is an important part of my research, about which I have published extensively (as reflected in my C.V.). I have also consistently taught courses on law and statistics for two decades.
5. I am a Research Associate of the National Bureau of Economic Research, and a member of the American Academy of Arts and Sciences. I was a

Fellow at the Center for Advanced Studies in Behavioral Sciences in 2000-2001, and served as the co-editor (handling empirical articles) of the *American Law and Economics Review* for six years. I have also served as the President of the American Law and Economics Association and as Co-President of the Society of Empirical Legal Studies.

6. I am also a member of the Committee on Law and Justice of the National Research Council (“NRC”), which “reviews, synthesizes, and proposes research related to crime, law enforcement, and the administration of justice, and provides an intellectual resource for federal agencies and private groups.” (See <http://www7.national-academies.org/claj/online> for more information about the NRC.)
7. I filed an expert declaration in each of two cases involving a National Rifle Association (“NRA”) challenge to city restrictions on the possession of large-capacity magazines: *Fyock v. City of Sunnyvale*, United States District Court (N.D. Cal.), January 2014; *Herrera v. San Francisco*, United States District Court (N.D. Cal.), January 2014.
8. I also filed an expert declaration in a case involving an NRA challenge to Maryland’s restrictions on assault weapons and large-capacity magazines: *Tardy v. O’Malley*, United States District Court (District of Maryland), February 2014.

9. In all these cases, the relevant gun regulations have (ultimately) been sustained in the relevant federal appellate courts.
10. I also filed (June 1, 2017) an expert declaration in a case involving a challenge to California's restrictions on carrying of weapons in public: *Flanagan v. Becerra*, United States District Court (C.D. Cal.), Case No. 2:16-cv-06164-JAK-AS. Finally, I filed expert declarations on June 4, 2017 and June 16, 2017 in two separate cases challenging California's ban on the possession of large-capacity magazines: *Duncan v. Becerra*, United States District Court (S.D. Cal.), Case No. 17-cv-1017-BEN-JLB. and *Weise v. Becerra*, United States District Court (E.D. Cal.), Case No. 2:17-cv-00903-WBS-KJN.

SUMMARY OF CONCLUSIONS

11. It is a sound, evidence-based, and longstanding harm-reducing strategy virtually uniformly embraced throughout the developed world for governments to place constraints on the harm that weapons can inflict. Restrictions on the size of large-capacity magazines (LCMs) sit comfortably in this appropriate regulatory approach, and can be expected to reduce deaths and injury from gun violence.
12. A ban on LCMs would be expected to have little or no effect on the ability of individuals to possess weapons for self-defense in the home, but should

have a restraining impact on the effectiveness of those who have the criminal intent to kill as many individuals as possible. The LCM ban is thus well-tailored to limit the behavior of criminals engaging in the most dangerous forms of violent criminal behavior, and at the same time is likely to have little or no impact on the defensive capabilities of law-abiding citizens.

13. Over the last few decades, the number of households owning firearms has been declining, currently down to about 31 percent of Americans households. At the same time, the growth in gun purchases reflects the highly concentrated rate of ownership with 20 percent of gun owners now owning 60 percent of the nation's firearms. While there is far less evidence on ownership of large-capacity magazines, one would expect the ownership of such products to be at least as concentrated as gun ownership.

DISCUSSION

Gun Ownership Is Becoming More Concentrated In a Declining Portion of the Population

14. A discussion of the social science literature concerning gun ownership rates must begin with the General Social Science Survey (GSS), which is an annual survey conducted by the National Opinion Research Center, headquartered at the University of Chicago. The GSS is widely regarded by social science researchers as the most reliable indicator of national social

trends, in part because of its professional implementation of face-to-face interviews using a very large sample size (the latest GSS data comes from 2,867 respondents versus roughly 1000 in a typical telephone survey) with a high response rate (always in excess of 70 percent versus telephone survey responses which have fallen below 10 percent in recent surveys). *See* Pew Research Center, "Assessing the Representativeness of Public Opinion Surveys," (May 15, 2012), *available at* <http://www.people-press.org/2012/05/15/assessing-the-representativeness-of-public-opinion-surveys/>.

15. GSS data from 2016, the most recent year that data is available, states that 30.8% of American households have at least one gun, and that 20.5% of adults personally own a gun. *See* Donohue & Rabbani, "Recent Trends in American Gun Prevalence," (attached as Exhibit B). A carefully executed 2015 national survey showed that 34% of households owned guns, and that ownership of private firearms is highly concentrated among a small percentage of gun owners.¹

16. This is a considerable drop from the approximately 50% of United States households with one or more guns in the late 1970s, as reflected in GSS

¹ Azrael et al., "The Stock and Flow of US Firearms: Results from the 2015 National Firearms Survey," (Russell Sage Foundation J. Soc. Sci., forthcoming 2018) (attached as Exhibit C).

surveys. *See* Donohue & Rabbani, *supra*. Other national surveys show similar results, such as research by the Pew Research Center and the National Behavioral Risk Factor Surveillance System, which both find a persistent decline in household gun ownership over the past several decades. A recent report from the Pew Research Center states:

The Pew Research Center has tracked gun ownership since 1993, and our surveys largely confirm the General Social Survey trend. In our December 1993 survey, 45% reported having a gun in their household; in early 1994, the GSS found 44% saying they had a gun in their home. A January 2013 Pew Research Center survey found 33% saying they had a gun, rifle or pistol in their home, as did 34% in the 2012 wave of the General Social Survey.²

17. The weight of the survey evidence on gun ownership conducted over time shows that the percentage of household with guns today is lower than it was two decades ago.³

² Pew Research Center, "Section 3: Gun Ownership Trends and Demographics," *available at* <http://www.people-press.org/2013/03/12/section-3-gun-ownership-trends-and-demographics>.

³ While the GSS in 2016 put the percentage of American households with guns at less than 31%, the most recent Gallup survey found that 39% of American adults live in a household that contains a gun, and 29% personally own one. There is no consensus about why Gallup's estimates are somewhat higher than those from the more reliable GSS (and Pew) surveys, but it should be noted that the Gallup polls are far smaller surveys based on less reliable telephone interviews with dramatically lower response rates than the GSS. In any event, even the Gallup

18. The evidence that gun ownership is concentrated is strong and uncontradicted. Researchers analyzing the results of a 2015 national survey found that 8% of individual gun owners reported owning ten or more firearms—collectively accounting for 39% of the American gun stock—and that the 20% of gun owners who owned the most guns collectively possessed about 60% of the nation's guns.⁴ A decade earlier, researchers found a similar pattern: a 2004 survey indicated that 48% of gun owners possessed four or more guns and that the top 20% of firearms owners possessed 65% of all firearms.⁵

19. The FBI publishes records of the number of background checks requested, and such background checks are often initiated pursuant to a desired purchase of firearms. With only a couple of exceptions, the trend has been for the number of background checks conducted each year to grow every year.⁶ Gun industry trade groups cite increased background checks and an

results confirm the long-term decline in the proportion of American households owning firearms.

⁴ See Azrael et al., *supra*.

⁵ Hepburn et al., "The US Gun Stock: Results from the 2004 National Firearms Survey," *Injury Prevention* 2007;13:15-19.

⁶ See National Instant Criminal Background Check System (NICS) Firearm Checks: Month/Year 2017, *available at* https://www.fbi.gov/file-repository/nics_firearm_checks_-_month_year.pdf/view.

increase in collections of the federal excise taxes collected on the sale of firearms and ammunition as reflecting strong demand for firearms.⁷

20. Because reliable social science data shows that the number of households that own guns has likely dropped in recent decades, and certainly has not grown, it seems most likely that robust gun sales can be attributed not to increasingly broad gun ownership but instead largely to purchases of guns by members of households that previously owned guns.

21. While I am not aware of any current social science research providing an estimate for the number of American households that own large-capacity magazines or LCMs (defined as an ammunition feeding device with the capacity to hold more than 10 rounds of ammunition) or for the number of LCMs in private hands in America, we know that many American gun-owning households only possess handguns, shotguns, or rifles that do not accommodate LCMs.

22. Accordingly, the share of households containing a weapon with a large-capacity magazine will only be a subset of gun owners. This minority status of LCM ownership by household both reflects the judgment that most Americans and even more citizens of New Jersey do not consider LCMs to

⁷ See, e.g., NRA-ILA, "The Myth Of 'Declining' Gun Ownership" (July 13, 2016), available at <http://dailycaller.com/2016/07/13/the-myth-of-declining-gun-ownership/>.

be important to their self-defense, and would be consistent with a January 2013 New York Times/CBS News poll of 1,110 adults nationwide showing that nearly two-thirds of Americans favored a ban on large-capacity magazines.⁸

The Problem of Mass Shootings in the U.S. Is Getting Worse

23. Although the long-term secular trend in overall crime has been benign over the last 25 years, there has been a concurrent upward trend in mass shootings, from an average of 2.7 events per year in the 1980s to an average of 4.5 events per year from 2010 to 2013.⁹

24. Writing in May of this year, Louis Klarevas, an Associate Lecturer of Global Affairs at the University of Massachusetts–Boston, noted:

“Last week's school shooting in Texas marks a new milestone in American history. It's the first time we have ever experienced four gun massacres resulting in double-digit fatalities within a 12-month period.

⁸ Jennifer Steinhauer, "Pro-Gun Lawmakers Are Open to Limits on Size of Magazines," *N.Y. Times* (Feb. 18, 2013), *available at* <http://www.nytimes.com/2013/02/19/us/politics/lawmakers-look-at-ban-on-high-capacity-gun-magazines.html>.

⁹ William J. Krouse & Daniel J. Richardson, Cong. Research Serv., R44126, "Mass Murder with Firearms: Incidents and Victims," 1999-2013, at 14-15 (2015), *available at* <http://fas.org/sgp/crs/misc/R44126.pdf>; Mark Follman, "Yes, Mass Shootings Are Occurring More Often," *Mother Jones* (Oct. 21, 2014), *available at* <http://www.motherjones.com/politics/2014/10/mass-shootings-rising-harvard>.

In October 2017, 58 were killed at a concert in Las Vegas. A month later, 26 were killed at a church in Sutherland Springs, Texas. Earlier this year, 17 people lost their lives at a high school in Parkland, Fl. And to this list we can now add the 10 people who lost their lives at a high school in Santa Fe, Texas.”¹⁰

25. While the total number of deaths in these mass shootings has been too small relative to the overall homicide rate to overcome the downward trend in murders, mass shootings are particularly high-visibility events that are quite shocking to the public and unsettling to the sense of public safety. Horrific mass shootings – such as those perpetrated by white supremacists at a church in Charleston¹¹ and at Umpqua Community College in Oregon,¹² and by ISIS sympathizers at Inland Regional Center in San Bernardino¹³

¹⁰ Louis Klarevas, "After the Santa Fe massacre, bury the 'good guy with a gun' myth: Armed staffers won't deter shooters or keep kids safe," *N.Y. Daily News* (May 22, 2018), *available at* <http://www.nydailynews.com/opinion/santa-fe-massacre-bury-good-guy-gun-myth-article-1.4003952>.

¹¹ Alan Blinder & Kevin Sack, "Dylann Roof Found Guilty in Charleston Church Massacre," *N.Y. Times* (Dec. 15, 2016), *available at* <http://www.nytimes.com/2016/12/15/us/dylann-roof-trial.html> (noting Roof killed nine members of a black church in Charleston in June 2015).

¹² Julie Turkewitz, "Oregon Gunman Smiled, Then Fired, Student Says," *N.Y. Times* (Oct. 9, 2015), *available at* <http://www.nytimes.com/2015/10/10/us/roseburg-oregon-shooting-christopher-harper-mercier.html> (noting eight students and a professor were killed in an attack in Oregon in October 2015).

¹³ Christine Hauser, "San Bernardino Shooting: The Investigation So Far," *N.Y. Times* (Dec. 4, 2015), *available at* <http://www.nytimes.com/2015/12/05/us/san->

and at Pulse in Orlando¹⁴ – although small in number compared to the total number of homicides, have generated widespread apprehension and increased demand for effective responses from government.

26. In addition to the well-documented overall increase in mass public shootings in the United States, there has been an equally dramatic rise of these events in school settings.¹⁵ Indeed, the authors of a recent study on mass school shootings concludes that “More people have died or been injured in mass school shootings in the US in the past 18 years than in the entire 20th century.”¹⁶

Limiting the Size of Ammunition Magazines Should Save Lives and Reduce Injuries

27. It is widely recognized that gun control can limit the extent of gun violence,

bernardino-shooting-the-investigation-so-far.html (noting fourteen were killed in December 2015).

¹⁴ Gregor Aisch et al., "What Happened Inside the Orlando Nightclub," *N.Y. Times* (June 12, 2016), available at <http://www.nytimes.com/interactive/2016/06/12/us/what-happened-at-the-orlando-nightclub-shooting.html> (noting a gunman killed forty-nine in a June 2016 attack).

¹⁵ Antonis Katsiyannis, Denise K. Whitford, "Robin Parks Ennis. Historical Examination of United States Intentional Mass School Shootings in the 20th and 21st Centuries: Implications for Students, Schools, and Society," *Journal of Child and Family Studies*, 2018; DOI: 10.1007/s10826-018-1096-2.

¹⁶ Springer, "Rapid rise in mass school shootings in the United States, study shows: Researchers call for action to address worrying increase in the number of mass school shootings in past two decades," *ScienceDaily* (Apr. 19, 2018), available at www.sciencedaily.com/releases/2018/04/180419131025.htm.

and a variety of measures have been adopted throughout the developed world, including efforts to restrict who has access to weapons and where they may be carried and to restrict the types of guns in circulation and the size of ammunition magazines. As two political scientists explain, there are two primary rationales behind such measures: “One, they make it less likely that someone intent on violence will be able to get a gun. And two, by making the weapon less deadly, gun control laws reduce the danger that the victim of a gun attack will die.”¹⁷

28. Indeed, no single gun control measure is likely to be as effective in addressing the problem of mass shootings as the limitation on the size of the ammunition magazine, and the evidence from the ten year period when the federal assault weapons ban was in effect from 1994-2004 indicates that limiting the size of ammunition magazines to ten bullets saved lives and reduced the mayhem from mass shootings.

29. Louis Klarevas, the author of *Rampage Nation: Securing America from Mass Shootings* (Amherst, NY: Prometheus 2016) has become the primary authority on research concerning mass shootings in the United States. He concludes that bans on large-capacity magazines will be effective in

¹⁷ Jonathan Spiegler & Jacob Smith, "More mental health care alone will not stop gun violence," *The Conversation* (June 19, 2018), available at <https://theconversation.com/more-mental-health-care-alone-will-not-stop-gun-violence-94201>.

reducing the death toll from mass shootings. Klarevas finds that the use of large-capacity magazines leads to more bullet wounds for victims (thereby substantially increasing the death toll of those who are shot), results in more shots fired (thus increasing the number of individuals who are shot), and reduces the capacity of potential victims to flee to safety or take effective defensive action.

30. A review of the resolution of mass shootings and other public shootings unleashed with large-capacity magazines in the U.S. suggests that bans on large-capacity magazines can help save lives by forcing mass shooters to pause and reload ammunition. Citizens have frequently taken advantage of a perpetrator stopping to reload his weapon to tackle him or otherwise subdue him in at least 20 separate shootings in the United States since 1991, notably including the December 7th, 1993 shooting of passengers on a Long Island Railroad car,¹⁸ the October 29th, 1994 shooting near the grounds of the White House,¹⁹ and the January 8th, 2011 shooting in

¹⁸ "DEATH ON THE L.I.R.R.: The Rampage; Gunman in a Train Aisle Passes Out Death," *N.Y. Times* (Dec. 9, 1993), *available at* <http://www.nytimes.com/1993/12/09/nyregion/death-on-the-lirr-the-rampage-gunman-in-a-train-aisle-passes-out-death.html> (9-millimeter pistol, 15 round magazine).

¹⁹ Public Report of the White House Security Review, Department of the Treasury, 1995, *available at* <http://www.fas.org/irp/agency/ustreas/usss/t1pubrpt.html> (Chinese-made SKS semiautomatic rifle, 30 round magazine).

Tucson, AZ that targeted U.S. Congresswoman Gabby Giffords.²⁰ In many other incidents, targeted victims were able to escape while a shooter reloaded. Perhaps the most vivid illustration of this benefit was seen when at least nine children at Sandy Hook Elementary School were able to escape while Adam Lanza reloaded his 30 round LCM.²¹

31. On April 22, 2018, a man walked into a Nashville Waffle House and opened fire, killing 4 and wounding 7. The police credited a customer with ending the slaughter when he saw the shooter trying to reload his rifle. The 29 year old customer “burst out from behind a swinging door where he had been hiding, wrested the weapon away and threw it over a countertop.”²² When shooters stop to reload, they are overtaken by citizens, shot by police, or provide opportunities for escape, all of which government policy should

²⁰ "Crowd members took gunman down," *L.A. Times* (Jan. 9, 2011), *available at* <http://articles.latimes.com/2011/jan/09/nation/la-na-arizona-shooting-heroes-20110110> (9mm Glock handgun, 30 round extended magazine).

²¹ "Legislative Leaders Say Bipartisan Agreement Could Yield Nation's Strongest Gun-Control Bill," *The Hartford Courant* (Apr. 1, 2013), *available at* <http://www.courant.com/news/politics/hc-gun-deal-newtown-0413-20130401,0,7341094.story> (Bushmaster .223 caliber rifle, high capacity 30 round magazine). While some contend that 11 children were saved in this fashion at Sandy Hook, Louis Klarevas puts the number at 9 in his book, *Rampage Nation: Securing America from Mass Shootings* (Amherst, NY: Prometheus 2016). p. 22.

²² Christopher Mele & Jacey Fortin, "Man Sought in Waffle House Shooting Had Been Arrested Near White House," *N.Y. Times* (Apr. 22, 2018), *available at* <https://www.nytimes.com/2018/04/22/us/waffle-house-shooting.html>.

seek to facilitate. The lower the size of the magazine, the more reloading must take place in mass shooting situations.

32. Since 1990, New Jersey residents have been banned from acquiring large-capacity magazines that held in excess of 15 bullets, and the plaintiffs have not offered any evidence that this compromised anyone's right to self-defense. How the further restriction to only 10 rounds of ammunition, given its evident and demonstrated benefit to potential victims and police, becomes problematic for human safety is never explained.
33. There is not the slightest evidence that the federal restrictions on large-capacity magazines exceeding 10 rounds that was enacted in 1994 (and lapsed ten years later) compromised the safety of law-abiding citizens. Since large-capacity magazines are useful for those bent on mass killing, further limiting their availability will have a beneficial effect on a problem that is serious and growing in the United States.
34. It should be noted that even if a ban on large-capacity magazines does not reduce the criminal use of guns, it can be expected to reduce the overall death toll from the criminal use of guns for a host of reasons.
35. First, as I noted, Adam Lanza was able to kill more (a total of 20 children and six adults) because he was using lawfully purchased weapons equipped with a 30 round LCM. It may well be that Lanza would have criminally

abused the guns that his mother had made available to him even if he had not had an LCM, but there is every reason to believe that he would have killed fewer individuals if he had to persistently reload during his murderous rampage. In other words, the LCM ban is designed precisely to save lives and by raising the costs for killers, the LCM ban would be expected to advance that goal.

36. Second, while the plaintiffs conjure a situation that a law-abiding citizen will be overwhelmed by a criminal who carries a firearm with an LCM (but would otherwise be held off if the victim were allowed to have an LCM), the fact is that fewer law-abiding citizens will confront such heavily armed criminals if LCM's are banned. The federal assault weapons ban – which did not contain a ban on possession of LCM's, and thus would be considerably less effective than the more complete New Jersey prohibition – led to increases in the price of LCM's. Therefore, New Jersey's LCM ban should elevate the cost that a criminal will need to pay to procure an LCM, which means that fewer criminals will be equipped with LCM's (under standard economic principles). In other words, fewer law-abiding individuals will be confronted by a criminal with an LCM because of the LCM ban.

37. Third, most mass killings by Americans involve the use of guns, and many

of these killers – Adam Lanza (Newtown), James Holmes (the Batman movie killer in Aurora, Colorado killed 12 and injured 70), Jared Loughner (shooting Congresswoman Gabby Giffords), Stephen Paddock (who killed 58 and wounded roughly 500 in Las Vegas in October 2017) to name just a few – were drawn to a vision of killing large number of individuals in a certain way that included the use of LCM's. On November 5, 2009, Nidal Hassan killed 13 and injured more than 30 others at Fort Hood, near Killeen, Texas. When Hasan purchased his killing arsenal, he asked for "the most technologically advanced weapon on the market and the one with the highest standard magazine capacity."²³ This is exactly what one would do if one wanted to simply kill as many people as possible in the shortest amount of time. If one is serious about stopping mass killings, a good first step is to deprive such killers of their preferred killing approaches.²⁴

²³ Scott Huddleston, "Hasan Sought Gun with 'High Magazine Capacity,'" (Oct. 21, 2010), *available at* <http://blog.mysanantonio.com/military/2010/10/hasan-sought-gun-with-high-magazine-capacity/>.

²⁴ Anders Breivik who committed mass murder in Norway was aided in his efforts because of lax rules concerning LCM's in the United States. Breivik was very unhappy that he could not get the large-capacity magazines that he wanted to use since they were banned in Europe. In his manifesto, he wrote about his attempts to legally buy weapons, stating, "I envy our European American brothers as the gun laws in Europe sucks ass in comparison." Under the section titled, "December and January - Rifle/gun accessories purchased," Breivik wrote that he purchased ten

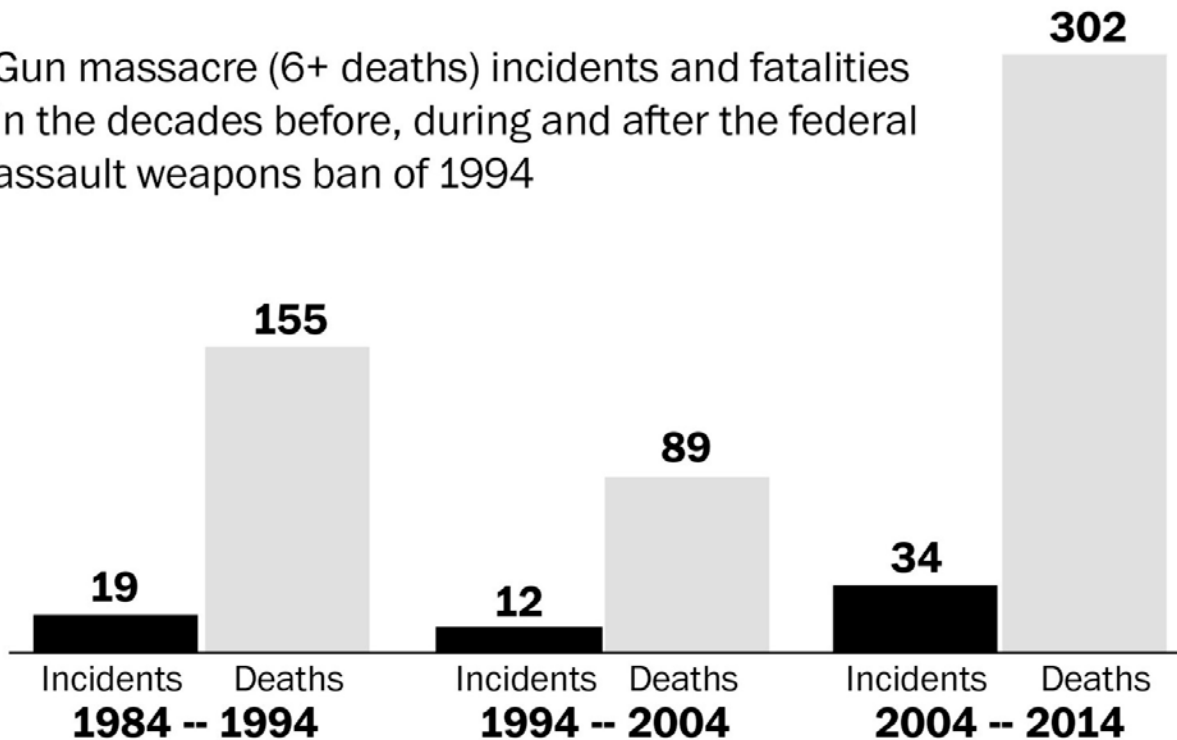
38. Louis Klarevas has illustrated that while the impact of restrictions on LCMs is less potent on other crimes, it appears to be quite significant with respect to the most deadly mass shootings in which at least six were killed, which he refers to as gun massacres. He found that, from 1994-2004, there were only 12 incidents – slightly over one per year – due to assault weapons, resulting in 89 deaths. In the following decade when the federal assault weapons ban was no longer in place, there was a dramatic surge in both the number of gun massacres and the total death toll: From 2004-2014, the number of gun massacres rose from 12 to 34 and the number of gun deaths jumped from 89 to 302. Moreover, since overall crime was trending down over this period, the link between the expansion of high capacity magazines following the lapse in the federal assault weapon ban and the increased number of gun massacres is further buttressed.²⁵

30-round ammunition magazines from a U.S. supplier who mailed the devices to him. Stephanie Condon, "Norway Massacre Spurs Calls For New U.S. Gun Laws," *CBS News* (July 28, 2011), *available at* <http://www.cbsnews.com/news/norway-massacre-spurs-calls-for-new-us-gun-laws/>.

²⁵ The plaintiffs cite a 2004 report that tried to tease out the effect of the federal assault weapons ban (which included a ban on newly manufactured high capacity magazines in excess of 10 rounds), but their citation is of little value to the current discussion. First, the federal ban was unlike the New Jersey ban under attack because the former grandfathered possession of existing high capacity magazines and indeed the delayed effective date of the law allowed gun merchants to flood the market with high capacity magazines before the federal ban became operative. Consequently, the period just prior to the implementation of the ban included a

Gun massacres fell during the assault weapons ban

Gun massacre (6+ deaths) incidents and fatalities in the decades before, during and after the federal assault weapons ban of 1994



Source: Louis Klarevas
THE WASHINGTON POST

flooding of the market with *legal* high capacity magazines, which would naturally tend to undercut the beneficial impact at least for a period of this particular gun control measure. Since the new law in New Jersey would prohibit all possession of high capacity magazines, it would clearly have a greater potential to achieve its goal of reducing the cost of gun violence than a simple prospective ban would do. Second, while the 2004 report was looking at the impact of the federal assault weapon ban on all crime, Klarevas has shown that the big impact of restrictions on large-capacity magazines is seen in the reduction in deaths in mass shootings. Finally, while the plaintiffs' brief does note that lax gun laws in neighboring states can weaken the effectiveness of gun bans, this is more of an argument for a revived federal ban on high capacity magazines than an argument that the states that are most committed to reducing the cost of gun violence should be restrained by the desires of a relatively small minority of Americans.

39. The events in Las Vegas on October 1, 2017, have underscored – yet again – the wisdom of the efforts of the New Jersey legislature “to aid in the shaping and application of those wise restraints that make men free” by banning from our state the large-capacity magazines (LCMs)²⁶ that were a key element enabling the extent of the carnage in that horrific mass shooting.²⁷

40. The first line of defense to reducing mass shootings is clearly to try to keep guns out of the hands of those who may end up using them for criminal purposes, but this approach will never be fully effective since not all killers can be easily identified in advance. Therefore, a critical element in trying to stop the death and injury from the growing problem of mass shootings is to limit the killing power of the weaponry available to the civilian population. Assault weapons bans are one important regulatory measure designed to achieve this goal, but the ability of gun merchants to design around such bans is well-established. The value of a ban on high capacity magazines is that it is easily definable, hard to circumvent through cosmetic

²⁶ LCMs are defined as ammunition-feeding devices with the capacity to hold more than 10 rounds of ammunition.

²⁷ The quote is from John MacArthur Maguire and is enshrined at the Harvard Law School library. *See* <https://asklib.law.harvard.edu/friendly.php?slug=faq/115309>.

changes by gun merchants, and effective at somewhat reducing the lethality of mass shooters by limiting the number of bullets that can be fired without reloading. Indeed, an effective ban on high capacity magazines would likely have significantly reduced the number of deaths at the Las Vegas concert because Stephen Paddock would have only been able to fire one-third the number of bullets he did had he been forced to rely on guns with only 10 bullets in each magazine (instead of the thirty he used).

41. The *New York Times* video of the recent Las Vegas shooting shows how the Las Vegas concert attendees would use the pauses in firing when the shooter's high-capacity magazines were spent to flee the deadly venue before more shots were fired.²⁸ If Stephen Paddock had been limited to using only 10-round magazines during his deadly rampage, potentially hundreds of victims at the concert could have been spared.
42. It is my opinion that if, rather than allowing the federal ban on these devices to lapse in 2004, the country had moved to the more complete ban that New Jersey has finally adopted, tragedies like the one in Las Vegas would have been far less deadly and damaging to countless individuals who have been

²⁸ Malachy Browne, et al., "10 Minutes. 12 Gunfire Bursts. 30 Videos. Mapping the Las Vegas Massacre," N.Y. Times Video (Oct. 21, 2017), *available at* <https://www.nytimes.com/video/us/100000005473328/las-vegas-shooting-timeline-12-bursts.html>.

maimed and injured throughout the United States and perhaps the world.²⁹

It is also my opinion that the ban on possession of LCMs would decrease the mayhem from at least some mass killings, by making it incrementally harder for those bent on mass destruction to implement their criminal designs.

Use of LCMs for Self-Defense are Extremely Rare

43. In the face of the clear evidence from around the United States and the world, some of the comments in the complaint and plaintiffs' declarations in this case seem to suggest that large-capacity magazines might protect against crime rather than simply increase the death toll. First, it is worth noting that the vast majority of the time that an individual in the United States is confronted by violent crime, they do *not* use a gun for self-defense. Specifically, over the period from 2007-2011 when roughly 6 million violent crimes occurred each year, data from the National Crime Victimization Survey shows that the victim was not able to defend with a gun in 99.2 percent of these incidents – this in a country with 300 million guns in civilian hands.

²⁹ The horrendous mass killing in Norway by Anders Breivik, endangered by the restrictive gun laws of Europe, was salvaged by his ability to procure ten 30-round high-capacity magazines from the United States. Stephanie Condon, "Norway Massacre Spurs Call for New U.S. Gun Laws," *CBS News* (July 28, 2011), available at <https://www.cbsnews.com/news/norway-massacre-spurs-calls-for-new-us-gun-laws/>.

44. Second, even if a gun were available for self-defense use, the need for a LCM is slight according to decades of statements by NRA affiliated and pro-gun experts. For example John Lott has repeatedly made the following claims:

- based on “about 15 national survey[s] ... about 98 percent of [defensive gun uses] involve people brandishing a gun and not using them.”³⁰
- “When victims are attacked, 98 percent of the time merely brandishing a gun is enough to cause the criminal to stop his attack.”³¹
- “Considerable evidence supports the notion that permitted handguns deter criminals. In 98% of the cases, people simply brandish weapons to stop attacks.”³²

45. Gary Kleck offers a similar albeit less precise claim: “More commonly, guns are merely pointed at another person, or perhaps only referred to (“I’ve got a gun”) or displayed, and this is sufficient to accomplish the ends of the

³⁰ Statements by John R. Lott, Jr. on Defensive Gun Brandishing, Posted by Tim Lambert on Oct. 17, 2002 <http://scienceblogs.com/deltoid/2002/10/17/lottbrandish/>. Page 41, State of Nebraska, Committee on Judiciary LB465, February 6, 1997, statement of John Lott, Transcript prepared by the Clerk of the Legislature, Transcriber's Office.

³¹ John R. Lott, Jr., Packing Protection, Letters, *Chicago Sun-Times* (Apr. 30, 1997), Pg. 52.

³² John R. Lott Jr., "Unraveling Some Brady Law Falsehoods," *L.A. Times* (July 2, 1997).

user, whether criminal or non- criminal.”³³

46. Gun Owners of America cite published survey results on gun brandishing by Gary Kleck for the following statement about gun brandishing: “Of the ... times citizens use their guns to defend themselves every year, the overwhelming majority merely brandish their gun or fire a warning shot to scare off their attackers.”³⁴

47. In other words, a gun is used in defense less than 1 percent of the time when someone is attacked in the United States. In the “overwhelming majority” of cases (according to the plaintiffs’ expert) in the small percentage of the time that a gun *is* used, brandishing is all that is needed for defense. One would imagine that the vast majority of the times that the gun is fired in this increasingly small subset, it will be fired no more than 10 times.

48. Should there be a future case of a law-abiding citizen who 1) has a gun and 2) the need and opportunity to use it in self-defense, and 3) the desire to fire more than 10 rounds, the individual can either re-load the defensive weapon by inserting a new clip or by using a second weapon, which an increasingly

³³ Guns and Self-Defense by Gary Kleck, Ph.D., <http://www.pulpless.com/gunclock/kleck2.html>.

³⁴ Gary Kleck & Marc Gertz, "Armed Resistance to Crime: The Prevalence and Nature of Self-Defense with a Gun," 86(1) *Journal of Criminal Law and Criminology* 150-187 (Fall 1995), available at <https://pdfs.semanticscholar.org/91da/afbf92d021f06426764e800a4e639a1c1116.pdf>.

large number of gun owners currently possess. This implies that the LCM ban, which is designed to limit the mayhem caused by criminals engaging in the most dangerous forms of violent criminal behavior, is likely to have little or no impact on the defensive capabilities of law-abiding citizens in their homes.

Law Enforcement Support for LCM Bans

49. A prescient December 2016 editorial in the *Las Vegas Sun* noted the danger presented—and the lack of practical use for—LCMs:

By overwhelmingly supporting universal background checks for firearms purchases, Clark County voters made it abundantly clear last month that they were concerned about gun violence.

Now, it's time for Las Vegas-area lawmakers to go a step further to protect Nevadans and push to ban the sale of high-capacity magazines in the state.

Eight states and the District of Columbia already have imposed such prohibitions, and with good reason. There's simply no legitimate civilian use for magazines that hold dozens upon dozens of rounds of ammunition.

Don't believe us? Fine, then listen to Clark County Sheriff Joe Lombardo.

"I'm a very avid hunter, I was in the military myself, and there's no need to have a high-capacity magazine for any practical reason," Lombardo said during a recent interview with the *Sun*.

To the contrary, the dangers posed by such magazines are obvious. Lombardo says the time it takes for suspects to change magazines gives potential victims an opportunity to escape and law enforcement officials an opportunity to safely fire back. That being the case, the fewer times a shooter has to switch out magazines, the fewer the chances for people to get away and authorities to get a protected shot.³⁵

50. Sheriff Lombardo's views were similarly endorsed in the testimony of United States Attorney (District of Colorado) John Walsh before the Senate Judiciary Committee on February 27, 2013, in which he noted:

From the point of view of most law enforcement professionals, a perspective I share as a long-time federal prosecutor and sitting United States Attorney, shutting off the flow of military-style assault weapons and high-capacity magazines is a top public safety priority. [...]

One of the most disturbing aspects of the recent mass shootings our Nation has endured is the ability of a shooter to inflict massive numbers of fatalities in a matter of minutes due to the use of high-capacity magazines. High-capacity magazines were defined in the 1994 ban as magazines capable of holding more than 10 rounds, and this is a definition the Department endorses. The devastating impact of such magazines is not limited to their use in military-style assault rifles; they have also been used with horrific results in recent mass shootings involving handguns. The 2007 mass shooting at Virginia

³⁵ "High-capacity magazine ban a must for Nevadans' safety," *Las Vegas Sun* (Dec. 11, 2016), available at <https://lasvegassun.com/news/2016/dec/11/high-capacity-magazine-ban-a-must-for-nevadans-saf/> (last visited Nov. 1, 2017).

Tech involved a shooter using handguns with high-capacity magazines. Similarly, recent mass shootings in Tucson, Arizona; Oak Creek, Wisconsin; and Fort Hood, Texas all involved handguns with magazines holding more than 10 rounds. As evidenced by these events, a high capacity magazine can turn any weapon into a tool of mass violence. Forcing an individual bent on inflicting large numbers of casualties to stop and reload creates the opportunity to reduce the possible death toll in two ways: first, by affording a chance for law enforcement or bystanders to intervene during a pause to reload; and second, by giving bystanders and potential victims an opportunity to seek cover or escape when there is an interruption in the firing. This is not just theoretical: In the mass shooting in Tucson, for example, 9-year old Christina-Taylor Green was killed by the 13th shot from a 30-round high-capacity magazine. The shooter was later subdued as he was trying to reload his handgun after those 30 shots. The outcome might have been different if the perpetrator had been forced to reload after firing only 10 times.

Furthermore, high-capacity magazines are not required for defending one's home or deterring further action by a criminal. The majority of shootings in self-defense occur at close range, within a distance of three yards. In such a scenario, and at such close ranges, a 10-round magazine is sufficient to subdue a criminal or potential assailant. Nor are high-capacity magazines required for hunting or sport shooting. Like military-style assault weapons, high-capacity magazines should be reserved for war, and for law enforcement officers protecting the public. The continued commercial sale of high-capacity magazines serves only to provide those determined to produce a high body count with the

opportunity and the means to inflict maximum damage. Indeed, there is evidence suggesting that when the previous ban was in effect, it reduced the number of high-capacity magazines seized by the police, as well as the lethality of incidents.³⁶ [The citation is from Walsh's statement.]³⁷

Gun Control Dramatically Reduced Mass Shootings in Australia

51. In this regard, consider what happened in Australia after a crazed gunman killed 35 people in Port Arthur, Tasmania in 1996. The Australian federal government persuaded all states and territories to implement tough new gun control laws. Under the National Firearms Agreement (NFA), firearms legislation was tightened throughout the country, national registration of guns was imposed, and it became illegal to hold certain long guns that might be used in mass shootings. The effect was that both while there were 13 mass public shootings in Australia during the period 1979–1996 (a per capita rate that was higher than in the U.S. at the time), there have been none in the 22 years since (while the problem of mass shootings in the

³⁶ See David S. Fallis & James V. Grimaldi, "In Virginia, high-yield clip seizures rise," *Wash. Post* (Jan. 23, 2011), available at <http://www.washingtonpost.com/wp-dyn/content/article/2011/01/22/AR2011012204046.html>.

³⁷ Statement of John F. Walsh before the United States Senate Committee on the Judiciary, <https://www.judiciary.senate.gov/imo/media/doc/2-27-13WalshTestimony.pdf>.

United States is getting worse³⁸).

52. The important point of the Australian experience for present purposes is that by depriving disturbed individuals of the vehicle by which they imagined they would unleash their murderous impulses, Australia showed that mass shootings can be dramatically reduced – even if guns are still widely available, as they remain in Australia.

Some Responses to Points in the Complaint and Declarations by Plaintiffs' Experts

53. I reviewed a declaration by James Curcuruto who works for a “trade association for the firearms industry.” Mr. Curcuruto provides irrelevant information, opining as his main conclusion that “There are at least one hundred million magazines of a capacity of more than ten rounds in possession of American citizens” (Curcuruto Report at Paragraph 12), only to concede later that he really does not know but “it is safe to say whatever the actual number of such magazines in United States consumers’ hands is, it is in the tens-of-millions....” (Curcuruto Report at Paragraph 22.)

54. While Mr. Curcuruto offers his wildly varying estimates of the number of

³⁸ Tristan Bridges & Tara Leigh Tober, "Mass shootings in the US are on the rise. What makes American men so dangerous?" *The Society Pages* (Dec. 31, 2015), available at <https://thesocietypages.org/socimages/2015/12/31/mass-shootings-in-the-u-s-what-makes-so-many-american-men-dangerous/>; Dan Diamond, "Mass Shootings Are Rising. Here's How To Stop Them," *Forbes* (June 18, 2015), available at <https://www.forbes.com/sites/dandiamond/2015/06/18/charleston-deaths-are-an-american-tragedy-mass-shootings-are-rising/#12bd32ef787b>.

high-capacity magazines in the United States, his undifferentiated national speculations offer no insight into how many of these magazines are possessed in rural areas throughout the United States. As a result, his figures would have little relevance to the appropriate regulatory regime for a state with large urban population centers like New Jersey.

55. I could not understand how Mr. Curcuruto's comments about the number of LCM's in other states were relevant to whether banning large-capacity magazines would save the lives of citizens of New Jersey. Obviously, if Congress had banned LCM's sufficiently earlier than 1994 and retained the ban there would be few in the hands of law-abiding citizens today. Governments certainly don't relinquish their ability and responsibility to protect their citizens simply because they do not perceive the need for action quickly enough or if technological advances or other developments generate new or greater dangers, such as the worsening problem of mass shootings in the United States.

56. The plaintiffs have also relied on the work of a firearm instructor Massad Ayoob (see Exhibit B to Plaintiffs' Declaration of Daniel L. Schmutter), who stated in an expert report he submitted in trying to overturn California's identical ban on the possession of LCMs:

“The average citizen is not trained like law enforcement personnel and is thus generally not readily prepared, mentally or physically, for combat with an armed criminal. As noted, they are likely to have a single firearm loaded with a single magazine available, and they are more susceptible to the psychological effects of fear, anxiety, and stress that naturally occur when faced with the threat of deadly violence and tend to deprive one of the focus and clarity of mind necessary to make accurate shots at the attacker.”

57. Of course, this is true, which also explains why citizen defense with guns occurs in such a tiny fraction of violent crimes. Ayoob offers no reason to believe that equipping a fearful, stressed individual who is unprepared both physically and mentally for combat with an armed criminal with more potent killing power will enhance citizen safety. As every gun expert knows, bullets from modern guns with large-capacity magazines can easily penetrate walls, which means that poorly directed shooting will pose a significant threat to other family members and neighbors.

58. The first paragraph of the complaint in this case alleges that “The State of New Jersey has criminalized one of the most common and important means by which its citizens exercise their fundamental right of self-defense. By banning the possession of standard-capacity firearm magazines that can carry more than 10 rounds of ammunition, the State has reached into the homes of its law-abiding citizens, invading their constitutional right to keep

and bear arms for the defense of themselves and their families in the most intimate of private spaces.” The claim that a ban on high capacity magazines of more than ten rounds constitutes an “important” interference with the right of self-defense seems blissfully unaware that for ten years this nation banned such magazines, and that crime fell substantially throughout the United States over this period.

59. In paragraphs 32 and 33 of their complaint, the plaintiffs offer examples of where large-capacity magazines were neither used nor needed to thwart criminal misconduct to argue that high capacity magazines are needed for self-defense, but these anecdotes instead stand for the exact opposite proposition. Presumably, the complaint or one of their expert witnesses would have cited an example of where a large-capacity magazine actually served some legitimate goal of self-defense if they could have found one but this is not easy to do since, as I noted above, the cases in which potential victims of crime have actually benefitted from having and using large-capacity magazines are extremely rare.

60. The complaint also betrays a deep ignorance of the rationale behind a ban on large-capacity magazines. Since the value of LCMs for legitimate self-defense is so limited, the primary impact of removing large-capacity magazines from circulation will be to decrease the prospect that a law-

abiding citizen will be confronted by a criminal with such weaponry. Even if the plaintiffs could have found an example where a large-capacity magazine was used lawfully for self-defense that would have little bearing on the relevant public policy question of whether all citizens of New Jersey would be made safer if criminals had less access to these devices designed to more effectively kill others.³⁹

61. Moreover, the frequent references to “law-abiding citizens” also betrays a lack of understanding of crime in America. First, one of the most important sources of arming criminals in the United States are “law-abiding citizens” whose guns are lost and stolen each year. The best current estimates are that

³⁹ The June 2017 order granting a preliminary injunction against implementation of the California ban on possession of LCMs in *Duncan v. Bacera* seemed to be persuaded that the facts of one case from Florida in 1997 in which a woman ran out of bullets in defending against a home invasion showed that such bans are harmful. It did not. First, as noted above, one episode from 21 years ago in a country as large as the United States does not provide powerful evidence on an issue of public policy. Second, the attackers in that case apparently were carrying LCMs, and the primary goal of the New Jersey ban is to reduce that prospect. Third, the article which the court relied on specifically noted that after the terrible home invasion (which thankfully she and her husband both survived), all of the family’s guns were subsequently stolen in a burglary when the family was not home. In other words, whatever benefit the woman might have had had she had a different weapon when first attacked (which of course involves some speculation – if she had been able to continue firing there is no guarantee things would have turned out better for her than they did), we know that if the lesson she drew from that incident was to have guns with LCMs in her house, those guns would have ended up in the hands of criminals after the burglary (as all her weapons did). Again, this underscores that LCMs in the hands of perfectly law-abiding citizens can and do add to arming of criminals – and this arming of criminals occurs vastly more often than any benign use of an LCM for self-defense.

roughly 400,000 guns move into the hands of criminals this way each year in the United States.⁴⁰ In other words, it is orders of magnitudes more likely that a criminal will steal a gun of a law-abiding citizen than a law-abiding citizen will fire more than 10 bullets in lawful self-defense. The more large-capacity magazines in the hands of law-abiding citizens means the more large-capacity magazines in the hands of criminals. Second, many of the most horrific mass shootings in America were perpetrated by previously law-abiding citizens. The list is too long to recite from Stephen Paddock (killed 58 in Las Vegas), Omar Mateen (killed 49 in Pulse nightclub), Adam Lanza (killed 26 in Newtown, Connecticut), Jared Loughner (killed 8 and severely wounded Congresswoman Gabby Giffords), the Batman killer in Aurora, Colorado who killed 12 in 2012, the

⁴⁰ According to Larry Keane, senior vice president of the National Shooting Sports Foundation (a trade group that represents firearms manufacturers), “There are more guns stolen every year than there are violent crimes committed with firearms.” More than 237,000 guns were reported stolen in the United States in 2016, according to the FBI’s National Crime Information Center. The actual number of thefts is obviously much higher since many gun thefts are never reported to police, and “many gun owners who report thefts do not know the serial numbers on their firearms, data required to input weapons into the NCIC.” The best survey estimated 380,000 guns were stolen annually in recent years, but given the upward trend in reports to police, that figure likely understates the current level of gun thefts. See Brian Freskos 2017c, “These Gun Owners Are at the Highest Risk of Having Their Firearms Stolen,” *The Trace* (Apr. 11, 2017), available at <https://www.thetrace.org/2017/04/gun-owners-high-risk-firearm-theft/>; Brian Freskos 2017b, “Missing Pieces,” *The Trace* (Nov. 20, 2017), available at <https://www.thetrace.org/features/stolen-guns-violent-crime-america/>.

Virginia Tech killer who killed 32, etc.

62. The complaint also tells us that “in 2011, New York City police officers fired more than 10 rounds in 29% of incidents in which they fired their weapons to defend themselves and others. The fact that police officers frequently need to fire more than 10 rounds to defend themselves suggests that law-abiding citizens likewise will sometimes find themselves in a similar situation.” But analogies to soldiers during war and “on duty, uniformed police officers” are entirely inapposite because the risks and responsibilities faced by soldiers and police are vastly different from those faced by civilians.
63. Private individuals have completely different needs than police officers. The former only need to scare off criminals (or hold them off until the police arrive). The police need to effectuate arrests. Thus, while having the criminal run away is a desired outcome for the average citizen, this is a bad outcome for a police officer, which is why an extended gun battle is extremely rare for law-abiding citizens and far more common for the police. Accordingly, plaintiffs’ effort to look to officer-involved shootings to make judgments about the needs of average citizens widely misses the mark.
64. In opposing the ban on high-capacity magazines, Kleck seeks refuge in the argument that gunfights frequently involve a lot of “missing,” particularly

because the average citizen is not well-trained and is under stress when threatened. But the notion that more bullets will be sprayed by law-abiding citizens actually provides stronger support for a ban on LCMs rather than an argument against such a ban. Bullets fired by a modern weapon with an LCM will easily penetrate walls, threatening family members or occupants in attached dwellings. This point was dramatically underscored when a hapless concealed carry permit holder attending a gun safety class inadvertently fired his weapon, which discharged a bullet that easily penetrated the classroom wall, striking and killing the owner of the gun store who was working in the next room.⁴¹ Encouraging untrained, stressed individuals to spray bullets from a high-capacity magazine is a recipe for generating similar unwelcome outcomes that will put family members and

⁴¹ Peter Holley, "Ohio gun store owner accidentally killed by student during firearm-safety class," *Wash. Post* (June 19, 2016), *available at* https://www.washingtonpost.com/news/morning-mix/wp/2016/06/19/ohio-gun-store-owner-accidentally-killed-by-student-during-firearm-safety-class/?utm_term=.ed4c232d20ad.

Another example of how doors and walls do not stop bullets from modern handguns occurred on September 13, 2015, when "39-year-old Mike Lee Dickey was babysitting an 8-year-old Casa Grande, Arizona boy. According to police, at about 2 a.m., Dickey was in the bathroom removing his .45-caliber handgun from the waistband of his pants when he unintentionally discharged the gun. The bullet passed through two doors and struck the 8-year-old in his arm while he lay sleeping in a nearby bedroom. The boy was flown to a hospital in Phoenix for treatment." *See* "8-year-old boy unintentionally shot by babysitter," *Ohh Shoot* (Sept. 13, 2016), *available at* <http://ohhshoot.blogspot.com/2015/09/8-year-old-boy-unintentionally-shot-by.html>.

neighbors at considerable risk.

65. The complaint also makes the erroneous argument the ban on large-capacity magazines will tip the balance in favor of criminals who will have multiple magazines or multiple guns:

“Even if violent criminals were prevented from acquiring banned magazines, they could easily compensate by bringing multiple firearms or magazines with them to the scene of the crime. Their ability to do so is made possible by the fact that violent criminals, and not their law-abiding victims, choose the time and place of crimes and can plan accordingly. New Jersey’s law thus clearly favors criminals bent on mass mayhem, as they will ignore the law and continue using banned magazines; use multiple magazines, which can be switched out in a matter of seconds; use multiple firearms; or employ all of these strategies simultaneously. Law abiding citizens will be reduced to countering this threat with a single firearm equipped with a single sub-standard capacity magazine, as people generally are not in the habit of having spare firearms and magazines readily accessible to them at all times.”

66. This argument makes little sense. First, the right to have a weapon for self-defense in the home means that those who want multiple magazines and guns can buy them and keep them in their homes and nothing in the New Jersey law restricts that ability. Since New Jersey is not a right to carry state (and therefore enjoys a lower violent crime rate than it would have if it

were to have such a law⁴²), no one can expect to have a gun of any kind accessible to them at all times in the state of New Jersey.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: July 5, 2018

A handwritten signature in black ink, reading "John J. Donohue III". The signature is written in a cursive style with a horizontal line at the end.

John J. Donohue

⁴² See John Donohue et al., "Right-to-Carry Laws and Violent Crime: A Comprehensive Assessment Using Panel Data and a State-Level Synthetic Controls Analysis," NBER Working Paper (June 2018) (finding that adopting a right-to-carry law elevates violent crime, leading to increases of roughly 13-15 percent after ten years).

EXHIBIT A

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EMPLOYMENT

Full-time Positions

- Stanford Law School, C. Wendell and Edith M. Carlsmith Professor of Law, September 2010 to the present.
- Yale Law School, Leighton Homer Surbeck Professor of Law, July 2004 to August 2010.
- Stanford Law School, Professor of Law, September 1995 to June 2004.
 - William H. Neukom Professor of Law, February 2002 – June 2004.
 - John A. Wilson Distinguished Faculty Scholar, March 1997 – January 2002.
 - Academic Associate Dean for Research, since July 2001 – July 2003.
 - Stanford University Fellow, September 2001 – May 2003.
- Northwestern University School of Law:
 - Class of 1967 James B. Haddad Professor of Law, September 1994-August 1995
 - Harry B. Reese Teaching Professor, 1994-1995
 - Professor of Law, May 1991-September 1994
 - Associate Professor, May 1989-May 1991
 - Assistant Professor, September 1986-May 1989.
- Research Fellow, American Bar Foundation, September 1986-August 1995.
- Associate Attorney, Covington & Burling, Washington, D.C., October 1978-July 1981 (including last six months as Attorney, Neighborhood Legal Services)
- Law Clerk to Chief Justice T. Emmet Clarie, U.S. District Court, Hartford, Connecticut, September 1977-August 1978.

Temporary Appointments

- Visiting Professor, Bocconi University, Milan, Italy, October- November 2012, April 2014, and June 2015.
- 2011 Faculty Scholar in Residence, University of Denver Sturm College of Law, April 21-22, 2011.
- Visiting Fellow, The Milton Friedman Institute for Research in Economics, University of Chicago, October 2009
- Schmidheiny Visiting Professor of Law and Economics, St. Gallen University, November – December, 2007.
- Visiting Lecturer in Law and Economics, Gerzensee Study Center, Switzerland, June 2007.
- Visiting Professor, Tel Aviv University School of Law, May 2007.

- Herbert Smith Visitor to the Law Faculty, University of Cambridge, England, February 2006.
- Visiting Professor, Harvard Law School, January 2003.
- Fellow, Center for Advanced Studies in the Behavioral Sciences, Stanford, California, Academic year 2000-01.
- Visiting Professor, Yale Law School, Fall, 1999.
- Professor, Center for the Study of American Law in China, Renmin University Law School, Beijing, July 1998.
- Visiting Professor of Law and Economics, University of Virginia, January 1997.
- Lecturer, Toin University School of Law, Yokohama, Japan, May-June 1996.
- Cornell Law School, Distinguished Visiting Fellow in Law and Economics, April 8-12, 1996 and September 25-29, 2000
- Visiting Professor, University of Chicago Law School, January 1992-June 1992.
- Visiting Professor of Law and Economics, University of Virginia Law School, January 1990-May 1990.
- Fellow, Yale Law School Program in Civil Liability, July 1985-August 1986.
- Private Practice (part-time), New Haven, Connecticut, September 1981-August 1986.
- Instructor in Economics, Yale College, September 1983-August 1985.
- Summer Associate, Donovan Leisure Newton & Irvine, New York, Summer 1982.
- Summer Associate, Perkins, Coie, Stone, Olsen & Williams, Seattle, Washington, Summer 1976.
- Research Assistant, Prof. Laurence Lynn, Kennedy School of Government, Harvard University, Summer 1975.
- LSAT Tutor, Stanley Kaplan Education Center, Boston, Massachusetts; Research Assistant, Prof. Philip Heymann, Harvard Law School; Research Assistant, Prof. Gordon Chase, Harvard School of Public Health. (During Law School).

EDUCATION

Yale University, 1981-1986

- University Fellow in Economics; M.A. 1982, M. Phil. 1984, Ph.D. 1986.
 - Dissertation: "A Continuous-Time Stochastic Model of Job Mobility: A Comparison of Male-Female Hazard Rates of Young Workers." Awarded with Distinction by Yale.
 - Winner of the Michael E. Borus Award for best social science dissertation in the last three years making substantial use of the National Longitudinal Surveys--awarded by the Center for Human Research at Ohio State University on October 24, 1988.
- National Research Service Award, National Institute of Health.
- Member, Graduate Executive Committee; Graduate Affiliate, Jonathan Edwards College.

Harvard Law School, 1974-1977 (J.D.)

- Graduated Cum Laude.
- Activities: Law Clerk (Volunteer) for Judge John Forte, Appellate Division of the District Court of Central Middlesex; Civil Rights, Civil Liberties Law Review; Intra-mural Athletics; Clinical Placement (Third Year): (a)

First Semester: Massachusetts Advocacy Center; (b) Second Semester: Massachusetts Attorney General's Office--Civil Rights and Consumer Protection Divisions. Drafted comments for the Massachusetts Attorney General on the proposed U.S. Department of Justice settlement of its case against Bechtel Corporation's adherence to the Arab Boycott of Israeli companies.

Hamilton College, 1970-1974 (B.A.)

- Departmental Honors in both Economics and Mathematics
 - Phi Beta Kappa (Junior Year)
- Graduated fourth in class with the following academic awards:
 - Brockway Prize
 - Edwin Huntington Memorial Mathematical Scholarship
 - Fayerweather Prize Scholarship
 - Oren Root Prize Scholarship in Mathematics
- President, Root-Jessup Public Affairs Council.

PUBLICATIONS

Books and Edited Volumes:

- Law and Economics of Discrimination, Edward Elgar Publishing, 2013.
- Employment Discrimination: Law and Theory, Foundation Press, 2005, 2009 (2d edition) (with George Rutherglen).
- Economics of Labor and Employment Law: Volumes I and II, Edward Elgar Publishing, 2007. http://www.e-elgar.co.uk/bookentry_main.lasso?id=4070
- Foundations of Employment Discrimination Law, Foundation Press, 2003 (2d edition).
- Foundations of Employment Discrimination Law, Oxford University Press, 1997 (Initial edition).

Book Chapters:

- "Drug Prohibitions and Its Alternatives." Chapter 2 in Cook, Philip J., Stephen Machin, Olivier Marie, and Giovanni Mastrobuoni, eds, *Lessons from the Economics of Crime: What Reduces Offending?* MIT Press. 45-66 (2013).
- "The Death Penalty," Chapter in Encyclopedia of Law and Economics, Spring (2013).
- "Rethinking America's Illegal Drug Policy," in Philip J. Cook, Jens Ludwig, and Justin McCrary, eds, Controlling Crime: Strategies and Tradeoffs (2011), pp.215-289 (with Benjamin Ewing and David Peloquin).
- "Assessing the Relative Benefits of Incarceration: The Overall Change Over the Previous Decades and the Benefits on the Margin," in Steven Raphael and Michael Stoll, eds., "Do Prisons Make Us Safer? The Benefits and Costs of the Prison Boom," pp. 269-341 (2009).

- “Does Greater Managerial Freedom to Sacrifice Profits Lead to Higher Social Welfare?” In Bruce Hay, Robert Stavins, and Richard Vietor, eds., Environmental Protection and the Social Responsibility of Firms: Perspectives from Law, Economics, and Business (2005).
- “The Evolution of Employment Discrimination Law in the 1990s: A Preliminary Empirical Evaluation” (with Peter Siegelman), in Laura Beth Nielsen and Robert L. Nelson, eds., Handbook of Employment Discrimination Research (2005).
- “The Impact of Concealed Carry Laws,” in Jens Ludwig and Philip Cook, Evaluating Gun Policy: Effects on Crime and Violence (Washington D.C.: Brookings, 2003).

Articles:

- “More Gun Carrying, More Violent Crime,” *Econ Journal Watch*, Vol. 15, No. 1, 67-82, January 2018.
<https://econjwatch.org/articles/more-gun-carrying-more-violent-crime>
- “Right-to-Carry Laws and Violent Crime: A Comprehensive Assessment Using Panel Data and a State-Level Synthetic Controls Analysis” NBER Working Paper w23510, www.nber.org/papers/w23510, January 2018 (with Abhay Aneja, and Kyle Weber).
- “Saving lives by regulating guns: Evidence for policy,” *Science* 08 Dec 2017, Vol. 358, Issue 6368, pp. 1259-1261, <http://science.sciencemag.org/content/358/6368/1259.full> (with Phil Cook)
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WORKSHOPS AND ADDRESSES

- “Impact of Right to Carry Laws on Violent Crime,” Public Policy colloquium, Stanford Economics Department, January 22, 2018; SPILS Methods Workshop, **Stanford Law School**, January 25, 2018.
- Panelist, “Public Carry: Defending Against Efforts to Expand Carry Laws,” **National Gun Violence Prevention Meeting**, Washington, D.C., October 18, 2017
- “Keynote Presentation: Right-to-Carry Laws and Violent Crime,” Second Amendment Litigation & Jurisprudence Conference, **The Law Center to Prevent Gun Violence**, October 16, 2017.
- “The Latest Evidence on Abortion Legalization and Crime,” Conference on Empirical Legal Studies, **Cornell University**, October 13, 2017.
- “Comey, Trump, and the Puzzling Pattern of Crime in 2015 and Beyond,” **University of Texas School of Law and Economics Seminar**, April 24, 2017, Faculty Workshop, **UC Davis School of Law**, April 10, 2017; Law and Social Science Seminar, **Texas A&M University School of Law**, March 6, 2017; Quantlaw, **University of Arizona Law School**, February 17, 2017.
- Debate with Kent Scheidegger on Capital Punishment, Philosophy of Punishment Seminar, **JFK University School of Law**, March 18, 2017.
- “The Evidence on Guns and Gun Laws,” **Federal Bar Council Program on Guns and Gun Laws** -- Rancho Mirage, California, February 23, 2017.
- “Guns, Crime and Race in America,” Stanford’s Center for Population Health Sciences, **Stanford Medical School**, October 17, 2016.
- “Evaluating the Death Penalty,” Forum on California Propositions 62 and 66, **Stanford Law School**, September 14, 2016.
- “Empirical Analysis and the Fate of Capital Punishment,” Colloquium, Presley Center for Crime and Justice Studies; **University of California, Riverside**, October 24, 2016.
- “Gun Violence and Mental Illness,” Department of Psychiatry, **Stanford University**, August 25, 2016.
- “The Battle Over Gun Policy In America,” Physicians and Social Responsibility” seminar; **Stanford Medical School**, October 3, 2016; **Bioethics Committee of the San Mateo County Medical Association**, April 27, 2016; **The League of Women Voters of Palo Alto**, April 19, 2016; Human Rights and Health Seminar, **Stanford University**, April 12, 2016; Bechtel International Center, **Stanford University**, February 23, 2016; Stanford in Government Seminar, Haas Center, **Stanford University**, February 2, 2016.
- American Economic Association Continuing Education Course “The Economics of Crime” (with Jens Ludwig), **AEA Annual Meeting**, San Francisco, January 5-7, 2016.

- “Race and Arbitrariness in the Connecticut Death Penalty,” **University of Connecticut School of Law**, Nov. 20, 2015.
- “*Connecticut v. Santiago* and the Demise of the Connecticut Death Penalty,” Faculty Workshop, **Stanford Law School**, August 19, 2015.
- “Do Handguns Make Us Safer? A State-Level Synthetic Controls Analysis of Right-to-Carry Laws,” Second Amendment Conference, **Covington and Burling, New York**, May 14, 2015; **NBER Summer Institute**, Cambridge, MA, July 23, 2015; Faculty Workshop, **Stanford Law School**, November 11, 2015.
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- “Can You Believe Econometric Evaluations of Law, Policy, and Medicine?” **Stanford Law School**, Legal Theory Workshop, March 1, 2007; Faculty Workshop, **Tel Aviv University School of Law**, May 14, 2007; Faculty Workshop, **University of Haifa Law School**, May 16, 2007; Law and Economics Workshop, **Georgetown Law School**, September 19, 2007; Law and Economics Workshop, **St. Gallen Law School**, Switzerland, November 29, 2007; and Yale Law School, February 25, 2008; Law and Economics Workshop, **Swiss Institute of Technology**, Zurich, Switzerland, May 21, 2008; Faculty Workshop, **University of Virginia Law School**, October 24, 2008; Plenary Session, Latin American and Caribbean Law and Economics Association, **Universitat Pompeu Fabra (Barcelona)**, June 15, 2009; **Google, Milan**, Italy, June 8, 2015.
- Commentator: ““Throw Away the Jail or Throw Away The Key? The Effect of Punishment on Recidivism and Social Cost,”” by Miguel F. P. de Figueiredo, American Law and Economics Association Meetings, **Columbia Law School**, May 15, 2015.
- “Broken Windows, Stop and Frisk, and Ferguson,” 2015 Justice Collaboratory Conference: Policing Post-Ferguson, **Yale Law School**, April 17, 2015.
- “Assessing the Development and Future of Empirical Legal Studies,” **Stanford Law School** course on Modern American Legal Thought, February 25, 2015.
- Commentator: “Payday Lending Restrictions and Crimes in the Neighborhood,” by Yilan Xu, 9th Annual Conference on Empirical Legal Studies, **Boalt Hall**, Berkeley, CA, November 7, 2014.
- “An Empirical Evaluation of the Connecticut Death Penalty Since 1973: Are There Unconstitutional Race, Gender and Geographic Disparities?” Faculty Workshop, **Economics Department, Rice University**, Houston, TX, Feb. 18, 2014; Law and Economics Workshop, **University of Virginia Law School**, September 11, 2014; Faculty Colloquium, **University of San Diego School of Law**, October 3, 2014.
- “What’s Happening to the Death Penalty? A Look at the Battle in Connecticut,” **Hamilton College**, Clinton, New York, June 6, 2014.
- Panel Member, Research Methods Workshop, Conference for Junior Researchers on Law and Society, **Stanford Law School**, May 15, 2014.

- "Logit v. OLS: A Matter of Life and Death," Annual Meeting of the American Law and Economics Association, **University of Chicago**, May 9, 2014.
- "Guns: Law, Policy, Econometrics," Second Amendment Litigation and Jurisprudence Conference, **Jenner & Block**, Chicago, May 8, 2014.
- "The Impact of Antidiscrimination Law: The View 50 Years after the Civil Rights Act of 1964," **Renaissance Weekend**, Liguna Niguel, CA, Feb. 15, 2014.
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- "Gun Policy Debate," C-SPAN. National Cable Satellite Corporation, Jan. 16, 2014. <<http://www.c-span.org/video/?317256-1/GunPoli>>.
- "Trial and Decision in the Connecticut Death Penalty Litigation," Faculty Workshop, **Stanford Law School**, November 20, 2013.
- "Rethinking America's Illegal Drug Policy," Law and Economics Workshop, **Harvard Law School**, April 20, 2010; NBER Conference, "Economical Crime Control," **Boalt Hall**, Berkeley, CA, January 16, 2010; **NBER Summer Institute** Pre-Conference "Economical Crime Control," July 23, 2009; **Whitney Center** Lecture Series, Hamden, CT, October 5, 2009; Law and Economics Workshop, **University of Chicago Law School**, October 13, 2009; Seminar for Spanish Law Professors, **Harvard Law School**, October 23, 2009; The Criminal Law Society, **Stanford Law School**, March 31, 2011, **University of Denver Sturm College of Law**, April 21, 2011; Law and Economics Workshop, **Boalt Hall**, Berkeley, CA, October 17, 2011; Shaking the Foundations Conference, **Stanford Law School**, November 2, 2013.
- "The Challenge to the Connecticut Death Penalty," **Yale Law School**, Death Penalty Clinic, November 5, 2007; Graduate Student Seminar, November 11, 2009; Stanford Program in International Legal Studies Seminar, **Stanford Law School**, Nov. 11, 2010; Faculty Workshop, **Stanford Law School**, June 8, 2011; Faculty workshop, **Duke Law School**, April 13, 2012; Program on Public Policy, **Stanford University**, May 2, 2012; Annual Meeting of the American Law and Economics Association, **Vanderbilt Law School**, Nashville, TN, May 18, 2013; Faculty Workshop, **University of Arizona Law School**, October 17, 2013; 8th Annual Conference on Empirical Legal Studies, **University of Pennsylvania Law School**, October 26, 2013.
- Commentator: "How to Lie with Rape Statistics" by Corey Rayburn Yung, 8th Annual Conference on Empirical Legal Studies, **University of Pennsylvania Law School**, October 2013.
- "An Empirical Look at Gun Violence in the U.S." **University of Arizona Law School**, October 17, 2013
- Discussant, "Sex Offender Registration and Plea Bargaining," **NBER Labor Summer Institute**, Cambridge, MA, July 25, 2013.
- "What Works in the War Against Crime?" **Renaissance Weekend**, Jackson Hole, Wyoming, July 5, 2013.

- Seminar Presentation, "Statistics and the Streets – Curbing Crime, Realities of the Death Penalty, and Successes in Public Safety," **Renaissance Weekend**, Jackson Hole, Wyoming, July 5, 2013.
- Flashes of Genius (Glimpses of Extra-ordinarily Novel Thinking) -- "Stemming Gun Violence," **Renaissance Weekend**, Jackson Hole, Wyoming, July 5, 2013.
- "Can Laws Reduce Crime?" Safe Oakland Speakers Series, Holy Names University, Oakland, CA, May 1, 2013, <http://www.ustream.tv/channel/safe-oakland-speaker-series>
- Presentation on "The Death Penalty in America" on a panel on "human rights and criminal justice systems in the world," Science for Peace conference at Bocconi University in Milan, Italy, November 15, 2012. <http://www.fondazioneveronesi.it/scienceforpeace2012/>
- Seminar Presentation, "America's Criminal Justice System," **Renaissance Weekend**, Santa Monica, CA., Feb. 19, 2012.
- "Statistical Inference, Regression Analysis and Common Mistakes in Empirical Research," SPILLS Fellow's Workshop, **Stanford Law School**, February 2, 2012.
- "New Evidence in the 'More Guns, Less Crime' Debate: A Synthetic Controls Approach," Conference on Empirical Legal Studies, **Northwestern Law School**, November 4, 2011.
- "Drug Legalization and its Alternatives," *Lessons from the Economics of Crime: What Works in Reducing Offending?* **CESifo Venice Summer Institute Workshop**, July 22, 2011.
- "Incapacitating Addictions: Drug Policy and American Criminal Justice," in Rethinking the War on Drugs through the US-Mexico Prism, **Yale Center for the Study of Globalization**, May 12, 2011.
- Plenary Session: Flashes of Genius (Glimpses of Extra-ordinarily Novel Thinking) -- "Has Legalized Abortion Reduced Crime?" **Renaissance Weekend**, Liguna Niguel, CA., Feb. 18, 2011.
- "An Evidence-Based Look at the More Guns, Less Crime Theory (after Tucson)" The American Constitution Society for Law and Policy (ACS), **Stanford Law School**, January 25, 2011; **Renaissance Weekend**, Liguna Niguel, CA., Feb. 19, 2011; "Faculty Forum" at the External Relations Office, **Stanford Law School**, April 5, 2011.
- "Empirical Evaluation of Law: The Dream and the Nightmare," SPILS Fellows Lecture, **Stanford Law School**, January 15, 2015; Legal Studies Workshop, **Stanford Law School**, Feb. 7, 2011; **Renaissance Weekend**, Liguna Niguel, CA., Feb. 20, 2011; **University of Denver Sturm College of Law**, April 22, 2011; Presidential Address, Annual Meeting of the American Law and Economics Association, **Columbia University**, May 20, 2011.
- Death Sentencing in Connecticut," **American Society of Criminology Annual Meeting**, San Francisco, Nov. 17, 2010.
- "The Impact of Right to Carry Laws and the NRC Report: Lessons for the Empirical Evaluation of Law and Policy," Conference on Empirical Legal Studies, **Yale Law School**, Nov. 6, 2010.

- Comment on Bushway and Gelbach, "Testing for Racial Discrimination in Bail Setting Using Nonparametric Estimation of a Parametric Model," Conference on Empirical Legal Studies, **Yale Law School**, Nov. 6, 2010.
- Commentator, "A Test of Racial Bias in Capital Sentencing," **NBER Political Economy Program Meeting**, April 23, 2010.
- "The (Lack of a) Deterrent Effect of Capital Punishment," Faculty Workshop, **University of Chicago Economics Department**, October 21, 2009.
- Keynote Address, "The Evolution of Econometric Evaluation of Crime and Deterrence," 1st Paris& Bonn Workshop on Law and Economics: The Empirics of Crime and Deterrence, **University of Paris Ouest Nanterre**, September 24, 2009.
- Comment on Cook, Ludwig, and Samaha, "Gun Control after *Heller*: Litigating Against Regulation," NBER Regulation and Litigation Conference, **The Boulders**, Carefree, Arizona, September 11, 2009.
- "Impact of the Death Penalty on Murder in the US," Faculty Workshop, Law School, **Universitat Pompeu Fabra (Barcelona)**, June 18, 2009.
- Comment on Joanna Shepherd's "The Politics of Judicial Opposition," Journal of Institutional and Theoretical Economics Conference, **Kloster Eberbach, Germany**, June 12, 2009.
- "The Great American Crime Drop of the '90s: Some Thoughts on Abortion Legalization, Guns, Prisons, and the Death Penalty," **Hamilton College**, Clinton, NY, June 5, 2009.
- "The Impact of the ADA on the Employment and Earnings of the Disabled," **American Law and Economics Association Meetings**, University of San Diego, May 15, 2009.
- "Crime and Punishment in the United States," **Eastern State Penitentiary, Yale Alumni Event**, Philadelphia, PA, April 26, 2009.
- "Measuring Culpability in Death Penalty Cases," Conference on Applications of Economic Analysis in Law, **Fuqua School of Business, Duke University**, April 18, 2009.
- "Autopsy of a Financial Crisis," Workshop on New International Rules and Bodies for Regulating Financial Markets, **State University of Milan**, March 23, 2009.
- "Yet Another Refutation of the More Guns, Less Crime Hypothesis – With Some Help From Moody and Marvell, Law and Economics Workshop, **NYU Law School**, March 10, 2009.
- Intelligence-Squared Debate: "Guns Reduce Crime," **Rockefeller University**, New York, October 28, 2008.
- "The D.C. Handgun Controls: Did the Supreme Court's Decision Make the City Safer?" Debate, **The Contemporary Club of Albemarle**, Charlottesville, VA, October 23, 2008.
- "Evaluating the Empirical Claims of the Woman-Protective Anti-Abortion Movement," Panel on The Facts of the Matter: Science, Public Health, and Counseling, Yale Conference on the Future of Sexual and Reproductive Rights, **Yale Law School**, October 11, 2008.
- "Empirical Evaluation of Gun Policy," **Harvard Law School**, October 9, 2008.

- “Assessing the Relative Benefits of Incarceration: The Overall Change Over the Previous Decades and the Benefits on the Margin,” **Russell Sage Foundation**, New York, May 3, 2007; Law and Economics Workshop, **Tel Aviv University School of Law**, May 28, 2008.
- Death Penalty Debate with Orin Kerr, Bloggingheads, April 11, 2008.
- “Evaluating Connecticut’s Death Penalty Regime,” Faculty Public Interest Conversation, **Yale Law School**, April 9, 2008.
- “The Death Penalty in Connecticut and the United States,” **The Whitney Center**, Hamden, CT, November 5, 2007; Seminar on Advanced Criminal Law: Criminal Sentencing and the Death Penalty, **Fordham Law School**, April 8, 2008; Law and Economics Workshop, **Swiss Institute of Technology**, Zurich, Switzerland, May 20, 2008.
- Radio Interview, “The Death of Capital Punishment?” Morning Edition: Where We Live. WNPR. Connecticut, March 10, 2008.
- Comment on Thomas Dee’s “Born to Be Mild: Motorcycle Helmets and Traffic Safety,” **American Economics Association Meetings**, New Orleans, Louisiana, January 4, 2008.
- “The Empirical Revolution in Law and Policy: Jubilation and Tribulation,” **Keynote Address, Conference on Empirical Legal Studies, NYU Law School**, November 9, 2007.
- “The Optimal Rate of Incarceration,” **Harvard Law School**, October 26, 2007.
- “Empirical Evaluation of Law: The Impact on U.S. Crime Rates of Incarceration, the Death Penalty, Guns, and Abortion,” Law and Economics Workshop, **St. Gallen Law School, Switzerland**, June 25, 2007.
- Comment on Eric Baumer’s “A Comprehensive Assessment of the Contemporary Crime Trends Puzzle,” Committee on Law and Justice Workshop on Understanding Crime Trends, **National Academy of Sciences**, Washington, D.C., April 25, 2007.
- Comment on Bernard Harcourt, Third Annual Criminal Justice Roundtable Conference, **Yale Law School**, “Rethinking the Incarceration Revolution Part II: State Level Analysis,” April 14, 2006.
- “Corporate Governance in America: The Disney Case,” **Catholic University Law School**, Milan, Italy, March 19, 2007.
- “The U.S. Tort System,” (Latin American) Linkages Program, **Yale Law School**, February 13, 2007.
- Panel Member, “Guns and Violence in the U.S.,” **Yale University, International Center**, January 24, 2007.
- “Economic Models of Crime and Punishment,” Punishment: The U.S. Record: A Social Research Conference at **The New School**, New York City, Nov. 30, 2006.
- Comment on Baldus et al, “Equal Justice and the Death Penalty: The Experience of the United States Armed Forces,” Conference on Empirical Legal Studies, **University of Texas Law School**, Austin, Texas, October 27, 2006.
- “Empirical Evaluation of Law: The Promise and the Peril,” **Harvard Law School**, October 26, 2006.

- “Estimating the Impact of the Death Penalty on Murder,” Law and Economics Workshop, **Harvard Law School**, September 12, 2006; Conference on Empirical Legal Studies, **University of Texas Law School**, October 28, 2006; Joint Workshop, Maryland Population Research Center and School of Public Policy, **University of Maryland**, March 9, 2007.
- “Why Are Auto Fatalities Dropping so Sharply?” **Faculty Workshop, Wharton**, Philadelphia, PA, April 19, 2006.
- “The Law of Racial Profiling,” Law and Economic Perspectives on Profiling Workshop, **Northwestern University Department of Economics**, April 7, 2006.
- “Landmines and Goldmines: Why It’s Hard to Find Truth and Easy To Peddle Falsehood in Empirical Evaluation of Law and Policy,” **Rosenthal Lectures, Northwestern University School of Law**, April 4-6, 2006.
- “The Impact of Legalized Abortion on Crime,” **American Enterprise Institute**, March 28, 2006.
- “The Impact of Damage Caps on Malpractice Claims: Randomization Inference with Difference-in-Differences,” **Conference on Medical Malpractice, The Rand Corporation**, March 11, 2006.
- “Powerful Evidence the Death Penalty Deters?” **Leighton Homer Surbeck Chair Lecture, Yale Law School**, March 7, 2006.
- “Uses and Abuses of Empirical Evidence in the Death Penalty Debate,” Faculty Workshop, **University of Connecticut Law School**, October 18, 2005; Faculty Workshop, **UCLA Law School**, February 3, 2006; Law and Economics Workshop, **Stanford Law School**, February 16, 2006; ; Law Faculty, **University of Cambridge, Cambridge, England**, February 28, 2006; **University of Illinois College of Law**, Law and Economics Workshop, March 2, 2006; Faculty Workshop, **Florida State University Law School**, March 30, 2006; **ALEA**, Berkeley, CA May 6, 2006; **University of Chicago Law School**, Law and Economics Workshop, May 9, 2006.
- “Is Gun Control Illiberal?” Federalist Society Debate with Dan Kahan at Yale Law School, January 31, 2006.
- “Witness to Deception: An Insider’s Look at the Disney Trial,” **2005-2006 Distinguished Lecture, Boston University School of Law**, November 10, 2005; Center for the Study of Corporate Law, **Yale Law School**, November 3, 2005; **Law Offices of Herbert Smith, London, England**, February 23, 2006; Law Faculty, **University of Cambridge, Cambridge, England**, February 27, 2006.
- “Understanding the Surprising Fall in Crime in the 1990s,” **Rotary Club**, Orange, CT, August 5, 2005; Faculty Workshop, **Yale School of Management**, September 21, 2005.
- Panel Member, “The Board’s Role in Corporate Strategy,” The Yale Global Governance Forum, **Yale School of Management**, September 8, 2005.
- “Crime and Abortion,” **Museo de la Ciudad de Mexico**, Mexico City, October 20, 2003.
- “Allocating Resources towards Social Problems and Away From Incarceration as a Means of Reducing Crime,” **MacArthur Foundation Research Network on Adolescent Development and Juvenile Justice**, San Francisco, CA, February 28, 2003.
- “Shooting Down the More Guns, Less Crime Hypothesis,” **Stanford Law School**, Law and Economics Seminar, January 28, 2003; Faculty Workshop, Center for the Study of Law and Society, **Boalt Hall**, University of California, Berkeley, Feb. 24, 2003; Development Workshop, **Stanford Law School**, April 25, 2003; Faculty Workshop, **Stanford Law School**, July 2, 2003; Law and Public Affairs Program Workshop, **Princeton**

University, September 29, 2003; Stanford Alumni Weekend, **Stanford University**, October 17, 2003; Faculty Workshop, **CIDE**, Mexico City, October 20, 2003.

- “The Impact of Legalized Abortion on Teen Childbearing,” **NBER Labor Summer Institute**, Cambridge, MA, July 30, 2002.
- “Do Concealed Handgun Laws Reduce Crime?” Faculty Workshop, **Stanford Law School**, October 4, 2000; First-Year Orientation, **Stanford Law School**, September 5, 2001; Faculty Workshop, **Harvard Law School**, April 26, 2002; Faculty Workshop, **Columbia Law School**, April 29, 2002.
- “The Evolution of Employment Discrimination Law in the 1990s: An Empirical Investigation,” Fellows Workshop, American Bar Foundation, February 11, 2002.
- “The Role of Discounting in Evaluating Social Programs Impacting on Future Generations: Comment on Arrow and Revesz,” Colloquium on Distributive Justice, **Stanford Law School**, Oct. 18, 2001.
- “The Impact of Wrongful Discharge Laws,” **NBER Labor Summer Institute**, Cambridge, MA, July 30, 2001; Labor and Employment Seminar, **NYU Law School**, October 16, 2001; Faculty Workshop, **Stanford Law School**, September 18, 2002; **Yale Law School**, January, 2004.
- “Racial Profiling: Defining the Problem, Understanding the Cause, Finding the Solution,” **American Society of Criminology Conference**, San Francisco, CA, November 15, 2000.
- “Institutional Architecture for Building Private Markets,” Conference on “Latin America and The New Economy” at **Diego Portales University** in Santiago, Chile, October 26, 2000.
- “The History and Current Status of Employment Discrimination Law in the United States,” Unicapital School of Law, (Centro Universitario Capital), Sao Paulo, Brazil, March 10, 2000.
- “Corporate Governance in Developing Countries: Opportunities and Dangers,” Conference on Neoliberal Policies for Development: Analysis and Criticism,” University of Sao Paulo Law School, March 13, 2000
- “Legalized Abortion and Crime,” Law and Economics Workshop, **University of Pennsylvania Law School**, September 21, 1999; Faculty Workshop, **Yale Law School**, September 27, 1999; **John Jay College of Criminal Justice**, October 7, 1999; Faculty Workshop, **Quinnipiac Law School**, October 13, 1999; Faculty Workshop, **University of Connecticut Law School**, October 19, 1999; **University of Virginia Law School**, October 25, 1999; Faculty Workshop, **Baruch College**, November 9, 1999; MacArthur Foundation Social Interactions and Economic Inequality Network Meeting, **Brookings Institution**, December 4, 1999; Faculty Workshop, **NYU Law School**, January 21, 2000; Faculty Workshop, **University of San Diego Law School**, February 18, 2000; Public Economics Workshop, Department of Economics, **Stanford University**, April 28, 2000; Law and Economics Workshop, **University of California at Berkeley Law School**, September 18, 2000; Faculty Workshop, **Cornell Law School**, September 26, 2000; OB-GYN Grand Rounds, **Stanford Medical School**, October 2, 2000; **Center for Advanced Studies in the Behavioral Sciences**, October 11, 2000; Faculty Workshop, **Graduate School of Business**, February 5, 2002.
- Panel member, Session on Executive Compensation, Director's College, **Stanford Law School**, March 23, 1999.
- “Exploring the Link Between Legalization of Abortion in the 1970s and Falling Crime in the 1990s,” Law and Economics Workshop, **Harvard Law School**, March 16, 1999; Law and Economics Workshop, **University of Chicago Law School**, April 27, 1999; Faculty Workshop, **Stanford Law School**, June 30, 1999.

- “Is the Increasing Reliance on Incarceration a Cost-Effective Strategy of Fighting Crime?” Faculty Workshop, **University of Wisconsin School of Social Science**, February 19, 1999.
- “What Do We Know About Options Compensation?” Institutional Investors Forum, **Stanford Law School**, May 29, 1998.
- Commentator on Orlando Patterson’s presentation on “The Ordeal of Integration,” **Stanford Economics Department**, May 20, 1998.
- “Understanding The Time Path of Crime,” Presentation at Conference on Why is Crime Decreasing? **Northwestern University School of Law**, March 28, 1998; Faculty Workshop, **Stanford Law School**, September 16, 1998; Faculty Workshop, **University of Michigan Law School**, February 18, 1999.
- Commentator, Conference on Public and Private Penalties, the **University of Chicago Law School**, Dec. 13-14, 1997.
- “Some Thoughts on Affirmative Action,” Presentation at a conference on Rethinking Equality in the Global Society, **Washington University School of Law**, November 10, 1997.
- Commentator on Chris Jencks’ Presentation on Welfare Policy, **Stanford Economics Department**, October 8, 1997.
- “The Impact of Race on Policing, Arrest Patterns, and Crime,” Faculty Workshop, **Stanford Law School**, September 10, 1997; Law and Economics Workshop, **University of Southern California Law School**, October 23, 1997; Law and Economics Workshop, **Columbia University Law School**, November 24, 1997; Law and Economics Workshop, Haas School of Business, **University of California at Berkeley**, February 19, 1998; Annual Meeting of the American Law and Economics Association, **University of California at Berkeley**, May 8, 1998; Conference on the Economics of Law Enforcement, **Harvard Law School**, October 17, 1998.
- “Crime in America: Understanding Trends, Evaluating Policy,” **Stanford Sierra Camp**, August 1997.
- “Executive Compensation: What Do We Know?” TIAA-CREF Committees on Corporate Governance and Social Responsibility, Center for Economic Policy Research, **Stanford University**, June 27, 1997; NASDAQ Director’s Day, **Stanford University**, June 30, 1997.
- Panel Chair, Criminal Law (Theory), Criminal Law (Empirical), and Labor/Discrimination/Family Law, American Law and Economics Association, **University of Toronto Law School**, May 9-10, 1997.
- Commentator, “Diversity in Law School Hiring,” **Stanford Law School**, February 25, 1997.
- Keynote Speaker, “The Optimal Rate of Crime,” 11th Annual Conference, **The Oklahoma Academy for State Goals**, Tulsa, Oklahoma, May 7, 1996.
- Panel member, Session on Executive Compensation, Director’s College, **Stanford Law School**, March 28-29, 1996.
- “The Power of Law: Can Law Make a Difference in Improving the Position of Women and Minorities in the Labor Market?” The Fellows of the **American Bar Foundation**, Baltimore, Maryland, February 3, 1996.
- “Public Action, Private Choice and Philanthropy: Understanding the Sources of Improvement in Black Schooling Quality in Georgia, 1911-1960,” **Stanford Faculty Workshop**, January 24, 1996; Faculty Workshop,

University of Virginia Law School, January 22, 1997; **National Bureau of Economic Research**, Cambridge, Massachusetts, Labor Studies Conference, April 3, 1998.

- Commentator, "The Effect of Increased Incarceration on Crime," Meetings of the **American Economics Association**, San Francisco, January 6, 1996.
- Commentator, Symposium on Labor Law, **University of Texas Law School**, November 10-11, 1995.
- Panel Member, Symposium on Criminal Justice, **Stanford Law School**, October 6-7, 1995.
- Commentator, "The Litigious Plaintiff Hypothesis," Industrial and Labor Relations Conference, **Cornell University**, May 19, 1995.
- Commentator on Keith Hylton's, "Fee Shifting and Predictability of Law," Faculty Workshop, **Northwestern University School of Law**, February 27, 1995.
- "The Selection of Employment Discrimination Disputes for Litigation: Using Business Cycle Effects to Test the Priest/Klein Hypothesis," **Stanford University**, Law and Economics Seminars, October 31, 1994.
- "Is the United States at the Optimal Rate of Crime?" Faculty Workshop, **Indiana University School of Law**, Indianapolis, November 18, 1993; Faculty Workshop, **Northwestern University School of Law**, April 18, 1994; Law and Economics Workshop, **Stanford Law School**, April 28, 1994; Meetings of the American Law and Economics Association, **Stanford Law School**, May 13, 1994; **American Bar Foundation**, September 7, 1994; Faculty Workshop, **DePaul Law School**, September 21, 1994; Law and Economics Workshop, **University of Chicago Law School**, October 11, 1994; Faculty Seminar, **Stanford Law School**, October 31, 1994; Law and Economics Luncheon, **Stanford Law School**, November 1, 1994; Faculty Seminar Workshop, **University of Illinois College of Law**, Champaign, November 22, 1994; Law and Economics Workshop, **Harvard Law School**, November 29, 1994; School Alumni Luncheon, Chicago Club, December 13, 1994; **Northwestern Law School**; Law and Economics Workshop, **Yale Law School**, February 1, 1996; Faculty Workshop, **Cornell Law School**, April 10, 1996; Faculty Workshop, **Tokyo University Law School**, June 4, 1996; Panel on "The Economics of Crime," **Western Economics Association** Meeting, San Francisco, July 1, 1996.
- "The Broad Path of Law and Economics," Chair Ceremony, **Northwestern University School of Law**, September 30, 1994.
- Commentator on Paul Robinson's "A Failure of Moral Conviction," **Northwestern University School of Law**, September 20, 1994.
- "The Do's of Diversity, The Don'ts of Discrimination," Kellogg School of Business, **Northwestern University**, May 17, 1994.
- "Does Law Matter in the Realm of Discrimination?" **Law and Society Summer Institute**, Pala Mesa Lodge, Fallbrook, California, June 25, 1993.
- Commentator, "The Double Minority: Race and Sex Interactions in the Job Market," Society for the Advancement of Socio-Economics, **New School for Social Research**, March 28, 1993.
- "The Effects of Joint and Several Liability on Settlement Rates: Mathematical Symmetries and Meta-Issues in the Analysis of Rational Litigant Behavior," Economic Analysis of Civil Procedure, **University of Virginia School of Law**, March 26, 1993.

- Debate with Richard Epstein on Employment Discrimination Law, **Chicago Federalist Society**, February 23, 1993.
- Panel Chair, "Optimal Sanctions and Legal Rules in Tort and Criminal Law," Meetings of Annual Association of Law and Economics, **Yale Law School**, May 15, 1992.
- Panel Member, "The Law and Economics of Employment at Will," **The Institute For Humane Studies**, Fairfax, Virginia, March 27, 1992.
- "The Efficacy of Title VII," Debate with Professor Richard Epstein, **University of Chicago Law School**, February 26, 1992.
- Moderator, "Using Testers to Demonstrate Racial Discrimination," **University of Chicago Law School**, February 13, 1992.
- "Law & Macroeconomics: The Effect of the Business Cycle on Employment Discrimination Litigation," Law and Society Workshop, **Indiana University**, November 6, 1991; Faculty Workshop, **University of North Carolina Law School**, Chapel Hill, November 8, 1991; Faculty Workshop, **Northwestern University School of Law**, December 11, 1991; Law and
- Economics Conference, **Duquesne Law School**, March 14, 1992; **University of Chicago Law School**, April 2, 1992.
- Panel Chair and Commentator, "New Perspectives on Law and Economics," **Society for the Advancement of Socioeconomics**, Stockholm, June 17, 1991; **Law and Society Meetings**, Amsterdam, June 29, 1991.
- Panel Chair, "Regulation of International Capital Markets," **Law and Society Meetings**, Amsterdam, June 27, 1991.
- Panel Chair, "The Law and Economics of Discrimination," American Association of Law and Economics, **University of Illinois Law School**, May 24, 1991.
- "The Economics of Employment Discrimination Law," **Industrial Relations Research Association**, Chicago, Illinois, March 4, 1991.
- "Does Current Employment Discrimination Law Help or Hinder Minority Economic Empowerment?" Debate with Professor Richard Epstein, The Federalist Society, **Northwestern Law School**, February 26, 1991.
- Panel Member, "The Law and Economics of Employment Discrimination," **AALS Annual Meeting**, Washington, D.C., January 6, 1991.
- "Re-Evaluating Federal Civil Rights Policy," Conference on the Law and Economics of Racial Discrimination in Employment, **Georgetown University Law Center**, November 30, 1990.
- "Opting for the British Rule," Faculty Seminar, **Northwestern Law School**, September 11, 1990; Faculty Seminar, **University of Virginia Law School**, September 14, 1990; Law and Economics Seminar, **University of Michigan Law School**, October 18, 1990; Faculty Workshop, **NYU Law School**, November 14, 1990; Faculty Workshop, **University of Florida Law School**, March 18, 1991.
- "The Effects of Fee Shifting on the Settlement Rate: Theoretical Observations on Costs, Conflicts, and Contingency Fees," at the **Yale Law School Conference "Modern Civil Procedure: Issues in Controversy,"** June 16, 1990.

- "Studying the Iceberg From Its Tip?: An Analysis of the Differences Between Published and Unpublished Employment Discrimination Cases," **Law and Society Meetings**, Berkeley, California, May 31, 1990.
- Panel Discussion on Tort Reform, **University of Pennsylvania Law School**, April 27, 1990.
- Panel Discussion of "The Role of Government in Closing the Socio-Economic Gap for Minorities," at the Federalist Society National Symposium on "The Future of Civil Rights Law," **Stanford Law School**, March 16, 1990.
- "Continuous versus Episodic Change: The Impact of Affirmative Action and Civil Rights Policy on the Economic Status of Blacks," **University of Virginia Economics Department**, February 15, 1990; **Princeton University Department of Economics**, February 21, 1990 (with James Heckman); Law & Economics Workshop, **University of Toronto Law School**, October 8, 1991.
- "Sex Discrimination in the Workplace: An Economic Perspective," Fellows Seminar, **American Bar Foundation**, October 16, 1989.
- "The Changing Nature of Employment Discrimination Litigation," Law and Economics Workshop, **Columbia Law School**, March 23, 1989; Faculty Seminar, **University of Virginia Law School**, March 24, 1989; Law and Economics Workshop, **University of Chicago**, April 25, 1989; **Law & Society Meeting**; Madison, Wisconsin, June 8, 1989; Labor Economics Workshop, **University of Illinois**, Chicago, November 1, 1989; Law & Economics Workshop, **University of Pennsylvania Law School**, November 9, 1989; Law and Economics Seminar, **University of California at Berkeley**, October 4, 1990; Law and Social Science Workshop, **Northwestern University**, February 3, 1991; Law and Economics Seminar, **Stanford Law School**, March 21, 1991; Faculty Workshop, **Cornell Law School**, April 3, 1991; Visiting Committee, **Northwestern Law School**, April 5, 1991.
- "Law & Economics: The Third Phase," The Association of General Counsel, **Northwestern University School of Law**, October 14, 1988.
- "Employment Discrimination Litigation," **Northwestern Law School** Alumni Monthly Loop Luncheon. **Chicago Bar Association**, May 31, 1988.
- "The Morality of the Death Penalty." A debate with Ernest Van Den Haag. **Northwestern University School of Law**, April 19, 1988.
- "Models of Deregulation of International Capital Markets." A presentation with David Van Zandt, Faculty Seminar, **Northwestern University School of Law**, April 1, 1988; Visiting Committee, May 5, 1988.
- "Is Title VII Efficient?" A debate with Judge Richard Posner, Faculty Seminar, **Northwestern University School of Law**, November 20, 1987.
- "The Senate's Role in Confirming Supreme Court Nominees: The Historical Record," **Northwestern University School of Law**, September 22, 1987.
- "Diverting the Coasean River: Incentive Schemes to Reduce Unemployment Spells," **Yale Law School** Civil Liability Workshop, March 30, 1987; Faculty Seminar, **Northwestern University School of Law**, March 18, 1987; **University of Southern California Law Center**, May 1, 1987; and Seminar in Law and Politics, Department of Political Science, **Northwestern University**, May 8, 1987; Labor Workshop, Department of Economics, **Northwestern University**, October 27, 1987; **AALS Annual Meeting**, New Orleans, January 7, 1989.
- "Women in the Labor Market--Are Things Getting Better or Worse?" **Hamilton College**, February 23, 1987.

- "The Changing Relative Quit Rates of Young Male and Female Workers," **Hamilton-Colgate Joint Faculty Economics Seminar**, February 23, 1987.
- "Living on Borrowed Money and Time--U.S. Fiscal Policy and the Prospect of Explosive Public Debt," **Orange Rotary Club**, February 22, 1985.
- "Capital Punishment in the Eighties," **Hamilton College**, April 6, 1981.
- "Terms and Conditions of Sale Under the Uniform Commercial Code," Executive Sales Conference, **National Machine Tool Builders' Association**, May 12, 1980.

PROFESSIONAL ACTIVITIES

- Member, Committee on Law and Justice, National Research Council, October 2011 – present.
- Fellow of the Society for Empirical Legal Studies, 2015 - present.
- Co-Editor (with Steven Shavell), American Law and Economics Review, May 2006 – August 2012.
- President, American Law and Economics Association, May 2011 – May 2012.
- Co-President, Society for Empirical Legal Studies, November 2011 - August 2012. Member, Board of Directors from November 2011 - November 2014.
- Testified before the Connecticut Legislature in Support of Senate Bill 1035 and House Bill 6425 (A Bill to Eliminate the Death Penalty), March 7, 2011; Testified again before the Connecticut Judiciary Committee on March 14, 2012.
- Member of the Special Committee on ALI Young Scholars Medal, October 2009 – February 2011.
- Vice-President/President Elect, American Law and Economics Association, June 2010 – May 2011.
- Secretary-Treasurer, American Law and Economics Association, June 2009 – May 2010.
- Board of Advisors, Yale Law School Center for the Study of Corporate Law, July 2004 – August 2010.
- Evaluated the Connecticut death penalty system: "Capital Punishment in Connecticut, 1973-2007: A Comprehensive Evaluation from 4600 murders to One Execution," http://works.bepress.com/john_donohue/137/
- Member, Panel on Methods for Assessing Discrimination, National Academy of Sciences, September 2001 – June 2004. Resulting Publication: National Research Council, Measuring Racial Discrimination (2004), <http://www.nap.edu/catalog/10887.html>
- Member, National Science Foundation Review Panel, Law and Social Sciences, September, 1999 – April 2001.
- Editorial Board, Journal of Empirical Legal Studies, July 2003 – present.
- Editorial Board, International Review of Law and Economics, October 1999 – present.
- Editorial Board, Law and Social Inquiry, February 2000 – present.
- Board of Editors, American Law and Economics Review, August 1998 – April 2013.

- Consultant, Planning Meeting on Measuring the Crime Control Effectiveness of Criminal Justice Sanctions, National Academy of Sciences, Washington, D.C., June 11, 1998
- Member, Board of Directors, American Law and Economics Association, June 1994-May 1997. Member, ALEA Nominating Committee, July 1995-May 1996. Member, Program Committee, July 1996-May 1998 and July 2000 – May 2002.
- Statistical Consultant, 7th Circuit Court of Appeals Settlement Conference Project (December, 1994).
- Testified before U.S. Senate Labor Committee on evaluating the Job Corps, October 4, 1994.
- Assisted the American Bar Association Standing Committee on the Federal Judiciary in evaluating the qualifications of Ruth Bader Ginsburg (June 1993) and David Souter (June, 1990).
- Chair, AALS Section on Law and Economics, January 1990-January 1991.
- Economic Consultant to Federal Courts Study Committee. Analyzing the role of the federal courts and projected caseload for Judge Richard Posner's subcommittee. February 1989-March 1990.
- Member, 1990 AALS Scholarly Papers Committee.
- Member, Advisory Board, Corporate Counsel Center, Northwestern University School of Law. Since December 1987.
- Associate Editor, Law and Social Inquiry. Summer 1987-December 1989.
- Interviewed Administrative Law Judge candidates for U.S. Office of Personnel Management. Chicago, Illinois. May 23, 1988.
- Member, Congressman Bruce Morrison's Military Academy Selection Committee. Fall 1983.
- 1982 Candidate for Democratic Nomination, Connecticut State Senate, 14th District (Milford, Orange, West Haven).

PRO BONO LEGAL WORK

- Death Penalty case: Heath v. Alabama. Fall 1986-Fall 1989.
- Wrote brief opposing death sentence in Navy spy case. Court ruled in favor of defendant on September 13, 1985.
- Staff Attorney, Neighborhood Legal Services, January-July 1981.
- Appealed sentence of death for Georgia defendant to the United States Supreme Court. Sentence vacated on May 27, 1980. Baker v. Georgia.
- Court-appointed representation of indigent criminal defendant in District of Columbia Superior Court, February-July 1980.

RESEARCH GRANTS

- Stanford University Research Fund, January 1997 and January 1998.
- The National Science Foundation (project with James Heckman), December 1992; (project with Steve Levitt), July 1997.

- Fund for Labor Relations Studies, University of Michigan Law School, March 1988.

BAR ADMISSIONS

- Connecticut - October 1977; District of Columbia - March 1978 (Currently Inactive Status); United States Supreme Court - November 1980; U.S. District Court for the District of Connecticut – February 14, 1978.

PROFESSIONAL and HONORARY ASSOCIATIONS

- American Academy of Arts and Sciences (since April 2009).
- Research Associate, National Bureau of Economic Research (since October 1996) – in Law and Economics and Labor Studies.
- American Law Institute (since September 29, 2010).
- Member, Fellows of the Society for Empirical Legal Studies (since October 2015).
- American Bar Association
- American Economic Association
- American Law and Economics Association

PERSONAL

- Born: January 30, 1953.

EXHIBIT B

Recent Trends in American Gun Prevalence*

John J. Donohue III[†] and Isaac J. Rabbani[‡]

June 23, 2017

Abstract

We explore trends in a variety of measures of gun prevalence, including direct surveys, proxies, and economic indicators. We find that firearm ownership, measured at both the individual and household levels, has declined significantly since the 1970s, though concentration of ownership has increased. The decrease seems attributable largely to reduced interest in hunting, as it has been driven by a drop in ownership of rifles and shotguns. Ownership of handguns, which are typically bought for self-defense, has remained stable, despite decreases in crime and in fear of danger.

Introduction

Recent high-visibility incidents involving firearms—especially mass shootings, such as that at Sandy Hook Elementary School—have renewed public interest in firearms legislation. In order to effectively tailor gun policy, it is important to understand the extent of gun prevalence in American society, whether this prevalence has changed over time, and if so, how—all of which have been the subjects of considerable media discussion (Bialik, 2013a; Brennan, 2012; NRA-ILA, 2016). One spokesperson for the National Rifle Association ascribed the drop in violent crime rates over recent decades to the passage of shall-issue laws, claiming that “[i]t would be disingenuous for anyone to not credit increased self-defense laws to account for this decline” (Miller, 2012). Opponents of this position claim that the reduction in crime was due to other factors; that despite the initiation of concealed-carry programs, gun ownership has actually declined; and further, that this decline, reflecting a shift in popular preferences, justifies calls for stricter regulation of firearm sales (Waldman, 2012).

In this paper, we review annual survey data at the national, state, and Census-Division levels, that track the prevalence of firearms in American households. Drawing on the larger gun policy literature, we then examine several commonly used proxy measures for gun prevalence. Both approaches lead to the same conclusions: Gun ownership in the U.S. has undergone a sustained and significant decrease over the past 35 years, and has simultaneously become more concentrated. Finally, we offer potential explanations for this decline, finding that the most salient is an abatement in interest in hunting, and that it is more difficult to judge the effects of other factors.

A Note on Terminology

For the remainder of the paper, we use the terms gun ownership and gun prevalence (or firearm ownership and firearm prevalence) interchangeably. One could argue that the two are actually subtly different: If one were studying the phenomenon of suicide committed by firearm, then perhaps a relevant factor to consider would be how accessible guns are to the everyday person—that is to say, prevalence. On the other hand, if one were studying changes in societal attitudes towards keeping a gun in the home, one might be more interested in the rate of household ownership. In practice, however—in part due to the paucity of data on

*We are extremely grateful to Deborah Azrael, Matthew Miller, Peter Siegelman, and Abhay Aneja for constructive comments, to Stephen Fischer Jr. of the FBI and Jaesok Son of the GSS for guidance on interpreting their data, and to Bhargav Gopal, Maggie Yellen, and Alex Albright for excellent research assistance.

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guns—the literature on this subject tends to use the ownership rate, especially the household ownership rate, as a yardstick for prevalence.

Survey Measures

Perhaps the most widely cited measure of national gun ownership is that of the General Social Survey (GSS), which has collected data on household gun ownership since 1973, and personal gun ownership since 1980, switching between annual and biennial collection in various years (Smith & Son, 2015). The GSS is considered to be one of the most reliable instruments for tracking broad social trends, especially relative to telephone surveys, because of its in-person interview format, large sample size (2,867 respondents in the 2016 survey), high response rates (consistently over 70%), and careful efforts to generate a representative sample of the U.S. population. Figure 1 shows that the GSS data reflect a substantial drop in household gun ownership levels since the late 1970s. In 2016, the GSS-reported percentage of households that contained a gun was 30.8%, a significant drop from a high¹ of 50.4% in 1977. Personal gun ownership, meanwhile, dropped from a peak of 30.5% in 1985 to 20.5% in 2016.

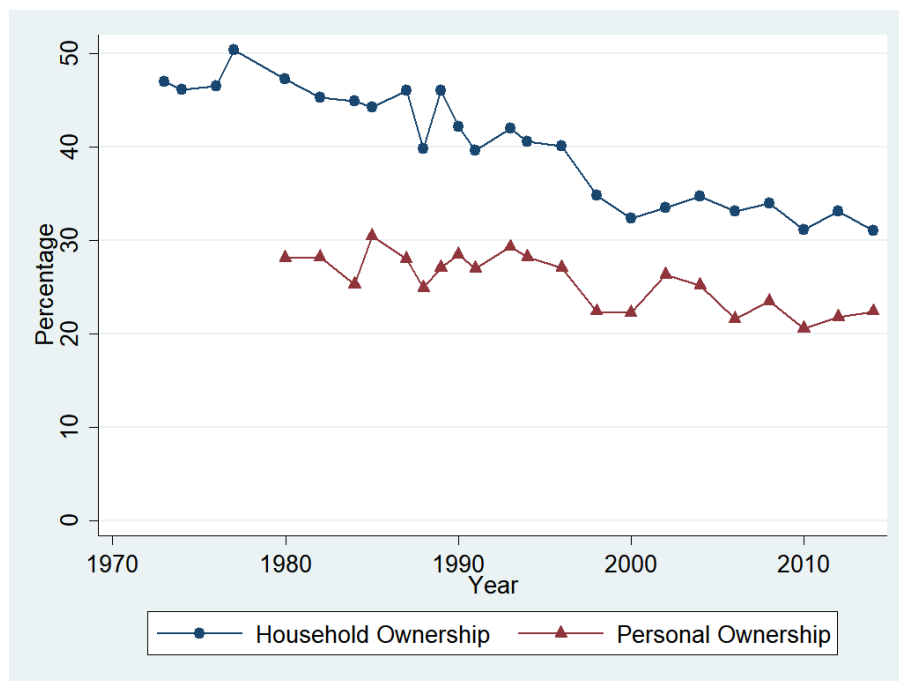


Figure 1: GSS-Measured Trends in Gun Ownership, 1973 - 2016.

The Pew Research Center has tracked gun ownership since 1993, and also reports a significant decrease. In Pew's 1993 survey, 45% responded yes to having a gun in their household (the corresponding GSS rate was 43.8%), and by 2013 this number had fallen to 33% (when the GSS recorded 34.4%) (Pew Research Center, 2013). In a report for the National Opinion Research Center—the organization that conducts the GSS, at the University of Chicago—Smith *et al.* (2014), using the iPoll archive, compile the results of 415 polls conducted between 1959 and 2013 that have surveyed national gun ownership. Going by the 364 of these that estimated a household rate, the authors estimate a decline in household gun ownership of 9 percentage points from the late 1970s to 2013,² and find that the annual trend of abatement is statistically significant and robust to controlling for various survey methodologies.³

¹All maximum and minimum survey values are taken over the entire period for which a survey question is asked.

²The authors use year ranges instead of individual years, and estimate a drop from 48.4% before 1980 to 39.4% in 2006-2013.

³Such methodological variations include in-person interviewing versus telephone interviewing; use of all adults as the polling base, versus restriction to registered voters; and different wordings of gun possession questions.

One major survey that deviates from the GSS, Pew, and the iPoll study is Gallup, which has tracked gun ownership since 1960, but finds a different pattern, as shown in Figure 2 (Gallup, 2015). Essentially, the Gallup surveys suggest that after 1960, gun ownership declined for twenty years, and since then has roughly stayed constant, albeit with some substantial temporary swings. Part of the reason for this volatility could be that the response rates for Pew's and Gallup's surveys—as they are conducted via telephone as opposed to in person—are typically much lower than that of the GSS (Pew Research Center, 2012).

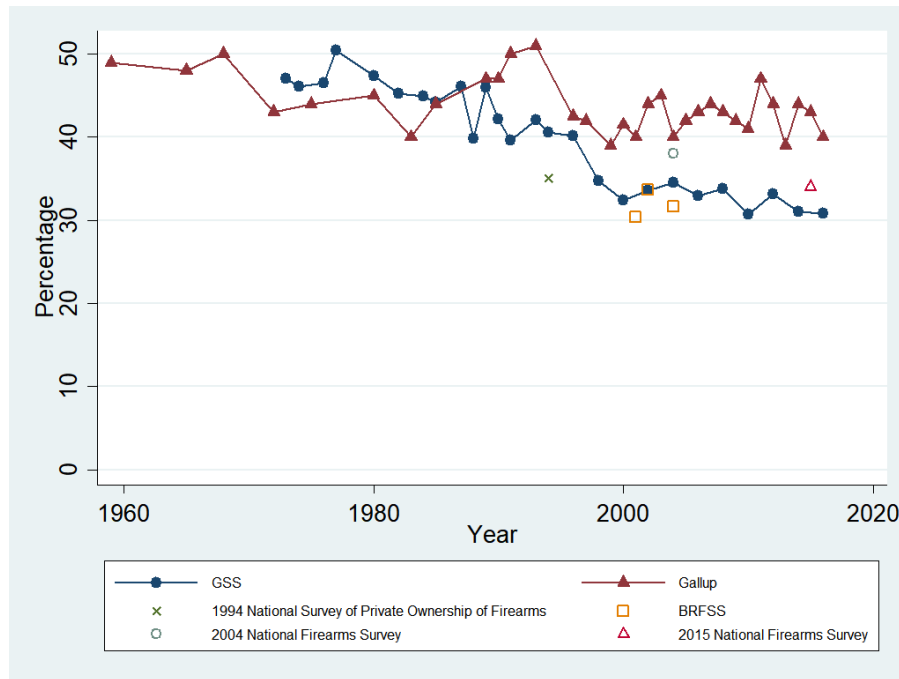


Figure 2: Survey Rates of National Household Gun Ownership, 1959 - 2015.

Criticism of Survey Evidence

The accuracy of survey results for controversial subjects such as gun ownership is often subject to debate. Skeptics of an ownership decline contend that many firearm owners are loath to reveal their true ownership status (Bialik, 2013b). Downward response error could result from fear that one owns or uses a gun illegally (whether or not that is the case), fear that the government will acquire the survey information and secretly maintain a database of gun owners, or from simply not knowing there is a gun in the household at all (National Research Council, 2004). But at least in the past, survey respondents seemed to answer gun questions willingly and accurately. In one survey of concealed-carry permit holders, Smith (2003) found that 94% accurately reported their status. Another experiment found that only 1 of 35 people living at addresses where handguns had recently been registered denied that any kind of gun had been kept in their home (Kellermann *et al.*, 1990).⁴ According to Tom Smith, director of the GSS, less than 1% of respondents have refused to answer the GSS gun ownership question since it started being asked (in 1973); the question is “asked well into [the] survey...They’ve already told us all kinds of things about themselves” (Bialik, 2013a).⁵ Low response rates are also cited as cause for concern, though once again this is principally a problem for telephone surveys, and in any case there is little reason to believe that non-responders are more likely than

⁴31 respondents acknowledged possession of a gun, and the other 3 claimed that a gun was recently kept in their home, but is no longer. False positives were not assessed since only those who had recently registered guns were surveyed. See Rafferty *et al.* (1995) for another example of such evidence.

⁵For further discussion of survey validity and methodologies, see Smith *et al.* (2014) and Chapter 2 of National Research Council (2004)

responders to be gun owners.⁶ Overall, the gun prevalence decline in the GSS data seems most likely to be accurate.

Proxy Measures

Background

Most surveys that include questions on gun ownership are conducted at the national level or within particular states, and are not conducted every year. The GSS, for example, is only constructed to be representative at the levels of the nine Census Divisions and the country. The CDC's Behavioral Risk Factor Surveillance System (BRFSS), another commonly used state-level survey, only included questions on gun ownership in all states in 2001, 2002, and 2004. Because these limitations often make survey data difficult to employ, especially when analyzing more granular geographic units, firearms researchers have developed several proxy metrics that are highly correlated with survey measures of gun ownership, but cover broader time periods and finer units. In order to build a more complete picture of recent trends in gun ownership, we compile several of these proxies,⁷ namely: the proportion of suicides committed by gun, the circulation rate of the firearm magazine *Guns & Ammo*, the per capita numbers of hunting licensees and federal firearms background checks, and the rate of accidental firearm death among children. Table 1 presents fixed-effects regressions, at the Census-Division and state levels, of the log of the GSS ownership rate on the log of each proxy.⁸ In the appendix, we also present simple pairwise correlation coefficients between national, Census-Division level, and state gun ownership rates and the corresponding proxies.

Criticism of Proxies

It should be noted that Kleck (2004) rejects the use of any gun ownership proxy to analyze inter-temporal trends, claiming that of the twelve proxies he examines, some capture inter-spatial variation in gun ownership, but none captures inter-temporal variation. His methodology, however, is to compare the annual percent change in each proxy to that of the GSS national gun ownership rate. As Hemenway (2012) rightly points out, in doing so he fails to take into account that “year-to-year changes in the GSS national measure of gun ownership...are probably almost entirely ‘noise.’ That changes in no other firearm proxy are highly correlated with this ‘noise’ does not mean other measures are bad (or good) proxies.” As Table 1 and Appendix Table 2 indicate, *levels* of certain proxies are strongly predictive of survey rates at the national and sub-national levels, even after controlling for region- and year-fixed effects.

Proxies

First validated by Miller *et al.* (2001), the fraction of suicides that are committed by gun—abbreviated FS/S, for firearm suicides divided by total suicides—is constructed from the CDC's National Vital Statistics System's Fatal Injury Reports, and is available from 1981 to 2015. FS/S has been shown to have strong and significant correlations with survey measures of gun ownership, both cross-sectionally and inter-temporally,

⁶Finally, Smith has said, and we have confirmed, that the rate of respondents refusing to answer the gun ownership questions has increased in recent years. As a check, we created an upper bound rate for which all refusers were assumed to have a gun in their home. For the Census Division-level data, for 180 of 225 observations (80%), this upper bound was at most 5% larger than the regular estimate. For the national-level data, the equivalent statistic is 22 of 25 (88%) observations with a difference below 5%.

⁷While there are specific criticisms against the use of each of the following proxies in statistical analysis, and we will enumerate some of those below, our goal is simply to get a more complete (if blurry) picture of gun prevalence trends. To that end, we defer to the literature, examining some of the proxies that are more commonly used by firearms researchers.

⁸The GSS is not constructed to be representative at the state level. However, note that for three of the five proxies—FS/S, licenses per capita, and circulation per capita—the coefficients at the Census-Division level are similar to those at the state level. This suggests that the state-level results are not too misleading, and that the other two proxies may simply be less reliable (for the reasons described below).

	(1)	(2)	(3)	(4)	(5)
	FS/S	Acc. Gun Death Rate	Licenses per Capita	Circ. per Capita	Checks per Capita
Coefficient	0.626*	0.0573**	0.207**	0.331**	0.609**
	(0.308)	(0.024)	(0.084)	(0.140)	(0.194)
Year Range	1982-2014	1982-1998	1973-2014	1980-2014	2000-2014
Number of Years	20	12	25	9	8
Adjusted R ²	0.438	0.219	0.461	0.395	0.127
N	180	107	225	81	72

All regressions are log-log, and include Division- and year-fixed effects. Standard errors (in parentheses) are clustered by Division.

Number of years used does not correspond exactly to year range due to gap years in administration of GSS gun ownership question.

All nine Census Divisions' data were included in this regression.

* p < 0.10, ** p < 0.05, *** p < 0.01

(a) Census-Division Level

	(1)	(2)	(3)	(4)	(5)
	FS/S	Acc. Gun Death Rate	Licenses per Capita	Circ. per Capita	Checks per Capita
Coefficient	0.593	0.0138	0.221**	0.393**	-0.0327
	(0.522)	(0.042)	(0.089)	(0.188)	(0.020)
Year Range	1982-2014	1982-1998	1973-2014	1980-2014	2000-2014
Number of Years	20	12	25	9	8
Adjusted R ²	0.641	0.642	0.663	0.637	0.577
N	515	286	644	230	203

All regressions are log-log, and include state- and year-fixed effects. Standard errors (in parentheses) are clustered by state.

Number of years used does not correspond exactly to year range due to gap years in administration of GSS gun ownership question.

Regressions are weighted by the number of respondents coming from the state in each year.

Because many states had small numbers of respondents in many years, these regressions include only the 26 states for which at least 10 years exist when the number of respondents from the state was greater than or equal to 20.

Regressions do not include the District of Columbia.

* p < 0.10, ** p < 0.05, *** p < 0.01

(b) State Level

Table 1: Regressions of Gun Ownership Rate on Proxies.

and as a result, has become the most widely-used proxy for the level of gun ownership (Cook & Ludwig, 2006; Briggs & Tabarrok, 2014; Kalesan *et al.*, 2015). Various criticisms have been levelled against its validity (Duggan, 2003; National Research Council, 2004; Shenassa *et al.*, 2006). Perhaps the most serious of these is that if use of a gun to commit suicide, given that it is a more effective method than drug overdose and hanging, is the result of a higher level of suicidal intent, then FS/S could simply be capturing “the average level of suicidal intent in the population” (Kleck, 2004). Furthermore, if suicidal intent is at least partly driven by some latent social unrest or dysfunction, and that unrest also pushes people to acquire guns (perhaps for self-defense), then a spurious positive correlation exists between FS/S and gun ownership. Nonetheless, our results, combined with those of the previously cited studies validating it, give us confidence in using the percentage of suicides by gun to proxy for gun ownership.

The Fatal Injury Reports also contain the rate of unintentional death by firearm, which exists from 1981 to 1998 at the state level, and 1981 to 2015 at the national level.⁹ We use this death rate among children aged 0 to 14 as another intuitive proxy for the level of gun prevalence: The number of unintentional firearm deaths in a given population and unit of time is feasibly a Poisson random variable whose rate parameter is proportional to, or at least increasing in, the availability of guns. One problem with this proxy is that it exhibits significant truncation, as roughly 20% of state-year rates are 0.¹⁰

Duggan (2001) first proposed utilizing per capita circulation of the firearm magazine *Guns & Ammo* as a proxy for gun ownership, and since then the practice has spread (Briggs & Tabarrok, 2014; Siegel *et al.*,

⁹This variable stops at 1998 at the state level because from 1999 on the CDC stopped reporting rates based on fewer than 10 deaths.

¹⁰The measurement of unintentional firearm deaths has also been found to suffer from some degree of error (Barber & Hemenway, 2011).

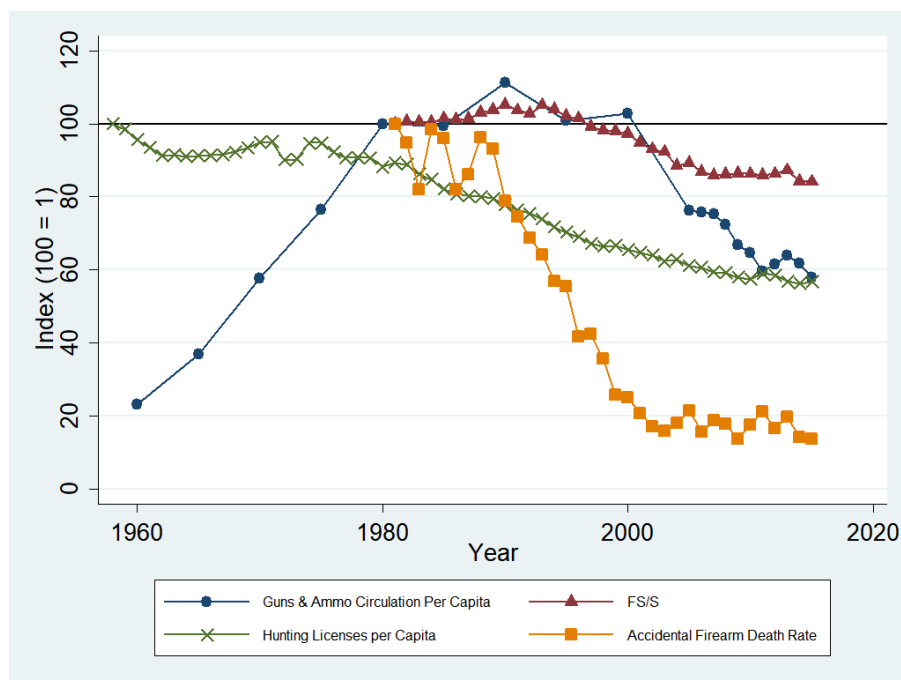


Figure 3: Trends in Gun Ownership Proxies, 1977 - 2015.

2014).¹¹ The magazine is one of the most popular amongst gun enthusiasts, with a total circulation of over 4.5 million in 2015, roughly 90% of which comes from subscriptions. Circulation data, which we have annually from 2005 to 2015, and in five-year increments from 1960 to 2000, is taken from the Alliance for Audited Media.

Siegel *et al.* (2014) introduce a novel proxy for gun ownership, a composite of FS/S with the (per capita) number of hunting license holders, the latter of which is available from the U.S. Fish and Wildlife Service starting in 1958. We look at FS/S and the hunting license measure separately, instead of as a composite. One caveat about this proxy is that it includes license holders who reside in *other* states as well, which means it is inflated for states where many people travel to hunt.¹²

Finally, the per capita number of background checks conducted through the National Instant Criminal Background Check System (NICS) is available from 1999, and has been offered as a proxy for firearm ownership. This measure is only valid if purchase rates for new firearms are proportional to current ownership rates.¹³ Even assuming this proportionality requirement holds, there is reason to be skeptical of the measure's usefulness: For one, NICS checks are only necessarily conducted by federally licensed firearms dealers, whereas a significant portion of gun sales are made through state or private dealers. Since regulations defining precisely which transactions require background checks vary widely from state to state and over time, it is problematic to compare this metric between states or years.

The way check numbers are aggregated is also important. The total number of NICS checks includes, among others, checks that are undergone when one *pawns* her firearm or applies for a firearm permit,¹⁴ as

¹¹Some opt to use circulation of *Field & Stream*, which is more hunting-oriented. We believe that our measure of hunting licenses per capita adequately captures the hunting pathway of gun ownership, and therefore utilize *Guns & Ammo*, which caters to a broader audience.

¹²This proxy is also vulnerable to significant year-to-year fluctuations due to animal movements and the like. However, because we have such a large sample on this variable (57 years for each state), we feel comfortable looking at its long-term trend nonetheless.

¹³One must also assume that each background check represents one gun purchase. Close inspection of the NICS data reveals that most checks for gun sales seem to represent only one gun type—that is, either handgun(s) or long gun(s). However, as the FBI itself warns, “based on varying state laws and purchase scenarios, a one-to-one correlation cannot be made between a firearm background check and a firearm sale.”

¹⁴Thirteen states and the District of Columbia have laws requiring a background check to purchase or possess a firearm (commonly known as “permit-to-purchase” laws). For these states, some proportion of the checks undergone for a firearm

well as administrative checks—essentially system tests—that are run when no firearm transaction is made at all. Moreover, when A sells a gun to B in a private transaction that is subject to a background check, the count of checks is augmented, but there is no change in gun prevalence. (Only the owner of the firearm has changed.) In the last ten years alone, four states—Colorado, Delaware, Oregon, and Washington—have adopted laws mandating universal background checks on private sales, thereby expanding the number of purchases that are counted without increasing the number of guns in circulation. We limit the checks we count to those resulting from the non-private purchases of handguns, rifles, shotguns, other gun types, and multiple gun types.¹⁵

We construct indices of each proxy, indexing values to the first observation of the series within a state or Division,¹⁶ and track their progress over the study period. Figure 3 shows that, at the national level, since 1980 four of our gun prevalence proxies have undergone decreases, ranging from 15% for FS/S to 85% for the accidental firearm death rate. Figure 4 shows a starkly different pattern for firearm background checks. We address this discrepancy in the next section.

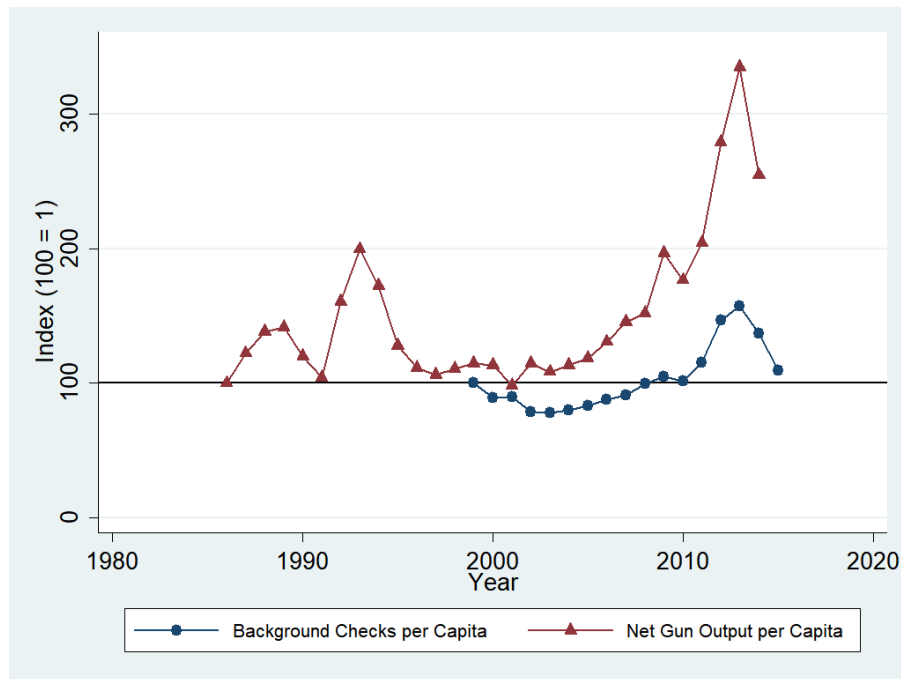


Figure 4: Trends in Gun Sales, 1986 - 2015.

Ownership Concentration

The increase in (per capita) NICS checks seems to indicate that the (per capita) number of guns in circulation has risen considerably, which is consistent with data from the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) U.S. Firearms Commerce Report (Department of Justice, 2015). As Figure 4 shows, per capita net output of firearms, where net output is defined as manufactures plus net imports, has increased

permit actually represent a purchase as well. After reviewing these states' laws, and consulting at length with FBI staff on how exactly checks are counted, we decided not to count permit checks towards the NICS metric, with one exception—Hawaii, which conducts solely permit checks because its firearm dealers opt not to re-check permit holders at the point of sale.

¹⁵To give readers an idea of this dataset, as of 2015, NICS check numbers are broken down into the following categories: Pre-Pawn, Redemption, Returned/Disposition, Rentals, Private Sale, Return to Seller - Private Sale, Permit, and four non-private sale categories representing the type(s) of gun being sold. It is these four columns (plus permit checks, for Hawaii) that go into our metric.

¹⁶The exception is the Guns & Ammo proxy, which we index to its 1980 value, as its initial movements more likely reflect the magazine's initial popularization—circulation began in 1958—than underlying gun ownership trends.

dramatically since the mid-2000s. An increase in privately held guns may seem counterintuitive in light of the evidence that household gun ownership has decreased. However, it is possible, given that the number of households has increased over the study period, that newer households have been less likely to buy guns than existing households, which are acquiring more of them. This would tend to increase the number of firearms in circulation but decrease overall prevalence.

Indeed, there is empirical evidence that individual households have been accumulating multiple firearms. Cook & Ludwig (1997), examining the results of the 1994 National Survey of Private Ownership of Firearms, found that 74% of gun owners owned two or more firearms, and that the 20% of owners who possessed the most guns collectively controlled 55% of privately owned firearms. Ten years later, Hepburn *et al.* (2007), looking at another national survey, found that of all individuals (households) that possessed a firearm, 48% (41%) owned at least four, and that the top 20% of owners controlled 65% of the country's guns. And most recently, in the 2015 iteration of the same survey, Azrael *et al.* (2017) find that 74% of owners have more than one gun, and that the top 20% possess 60% of the stock.¹⁷ Thus to the extent that NICS checks provide a useful proxy, it is crucial that they be interpreted as a proxy for firearm *sales*, and not for ownership, or they will tell a misleading story.

The Mexican Gun Trade

Another factor that compromises the validity of the NICS checks as a U.S. gun prevalence proxy is the scope of the illegal firearms trade, which exports many American-purchased guns to the rest of the world. According to the ATF's Firearms Tracing System, which traces guns recovered at crime scenes and logs their origins, 87,253, or 70.3%, of the firearms recovered in Mexico from 2009 to 2015 came from the US.¹⁸ The Government Accountability Office (2016) finds, further, that most of these had been bought legally at gun shops and gun shows in Texas, Arizona, and California. Another study estimated that from 2010 to 2012, 2.2% of domestic arms sales were attributable to U.S.-Mexico traffic, and 46.7% of federally licensed firearms dealers depended in part on demand from this trade to stay in business (McDougal *et al.*, 2015). To the extent that Mexico-bound guns are bought from federally licensed dealers, which are required to run background checks on unlicensed purchasers, or from state or private dealers that do run background checks, the NICS checks resulting from them artificially inflate the checks per capita proxy.

Explanations

Hunting

The most common purposes that firearm owners give for possessing a gun have consistently been self-protection and hunting (Azrael *et al.*, 2017; Hepburn *et al.*, 2007; Pew Research Center, 2013; Jelen, 2012). (The proportion that cites political beliefs as a reason is quite small.) Thus if gun prevalence has indeed declined on the scale we have suggested—and assuming supply-side factors have remained relatively stable—it is probably due to a decline in either the perceived need for self-defense, interest in hunting, or both. In Figure 5 we plot the evolution of the GSS-reported hunting rate alongside hunting licensees per capita; both indicate that Americans' tastes for hunting have abated steadily and substantially since the late 1970s. Whereas in 1977, 31.6% of adults reported being a hunter or married to one, in 2016 the corresponding rate was only 17.1%.

¹⁷An analysis of California's gun market from 1996 to 2015 finds that among dealerships, sales are highly and increasingly concentrated, with the top dealership handling over 10% of transactions (California Department of Justice, n.d.). If perennial gun buyers tend to stay loyal to particular dealerships over time, then this increase in dealership concentration could be consistent with an increase in ownership concentration, through a smaller gun-buying demographic buying more guns from a smaller pool of sellers.

¹⁸This figure consists of all recovered firearms "that were determined by ATF to be manufactured in the U.S. or legally imported into the U.S. by a Federal firearms licensee" (Bureau of Alcohol & Explosives, 2015, 2016). It is also likely an underestimate, as, for the other 29.7% of recovered firearms, the ATF cannot determine whether "the firearms were imported directly into Mexico, or if the firearms were legally imported into the U.S. or went to another country and then made their way to Mexico by legal or illegal means."

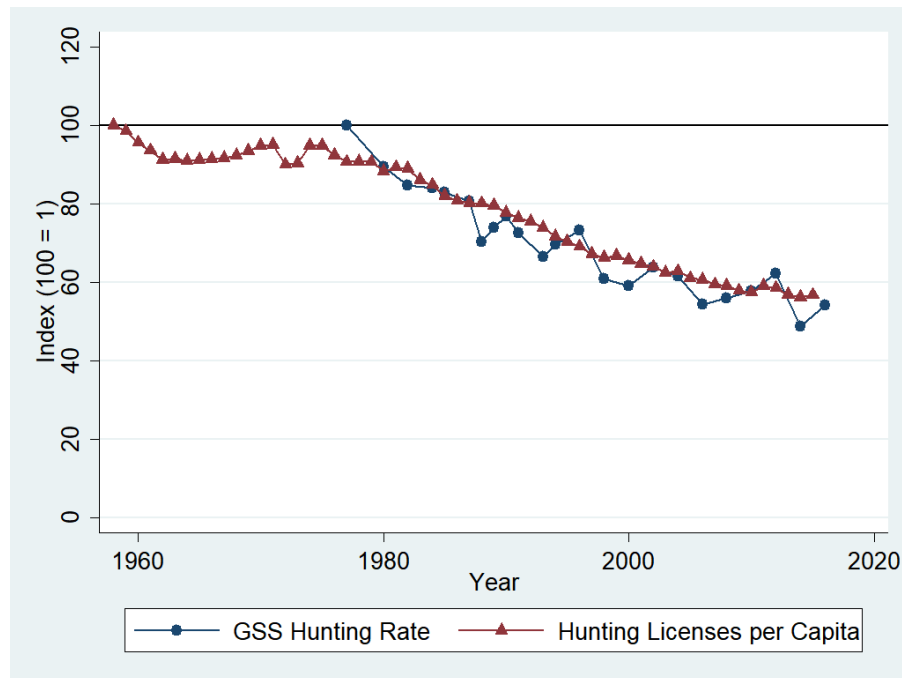
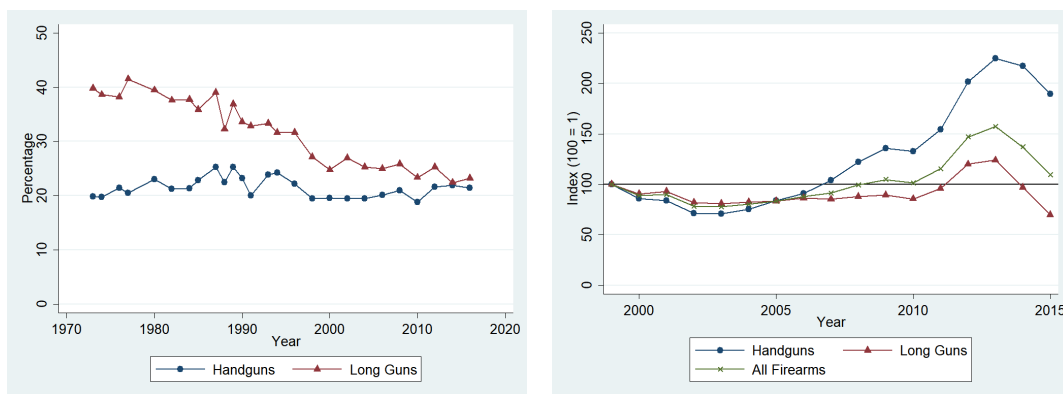


Figure 5: Trends in Hunting, 1977 - 2015.

If gun prevalence has declined through reduced interest in hunting, one would also expect to observe decreases in ownership of long guns—that is, rifles and shotguns—as these are disproportionately used by hunters. And indeed, between 1973 and 2016, the rate of handgun ownership remained relatively stable while that of long guns decreased dramatically, from 39.8% to 23.2% (Figure 6a). Furthermore, when we decompose per capita federal background checks based on whether they went towards handgun or long gun purchases, we find that the increase in checks noted above—and often cited in the press as indicating that overall ownership is actually increasing—has been overwhelmingly driven by increased handgun sales (Figure 6b). As we show in the Appendix, these findings are not confined to a particular region, but are consistent throughout the country.



(a) Household Gun Ownership by Type, 1973 - 2016. (b) Federal Background Checks per Capita, 1999 - 2015.

Figure 6: Handgun and Long Gun Trends.

Demographics

Demographic shifts could also partially explain the decrease in firearm prevalence. If certain groups own guns at systematically lower rates than their complements, and the proportion of the population in the lower-ownership groups increases, then overall gun ownership mechanically decreases as well. This seems a plausible story in the U.S., whose gun ownership rate varies significantly by sex, race, and other dimensions. In particular, going by national GSS ownership data, from 1980 to 2016 gun ownership was on average 31 percentage points higher among males than females, and 12 and 15 percentage points higher among Whites than Blacks and other-race respondents, respectively. The proportion of Whites in the U.S. population has decreased steadily by 10 percentage points since 1970, which would indeed tend to reduce overall gun ownership. The male proportion of the population, however, has actually increased by 1 percentage point since 1980, so shifts in the gender distribution cannot have been a channel of general ownership decreases.

Several publications have reported that interest in firearms and shooting sports has been increasing among women in recent years (Goode, 2013; Mann, 2012). Tabulating gun ownership by demographic, however, we find that female ownership has remained stable between 10 and 14% since 1980 (Figure 7).

Urbanization could also explain part of the gun prevalence decline. In the 2015 National Firearms Survey, 15% of urban, 19% of suburban, and 33% of rural dwellers owned at least one firearm. (Previous iterations of this survey yielded similar relative proportions.) From 1977 to 2015, the percentage of the U.S. population living in Census-designated Metropolitan Statistical Areas increased from 66 to 85%.¹⁹

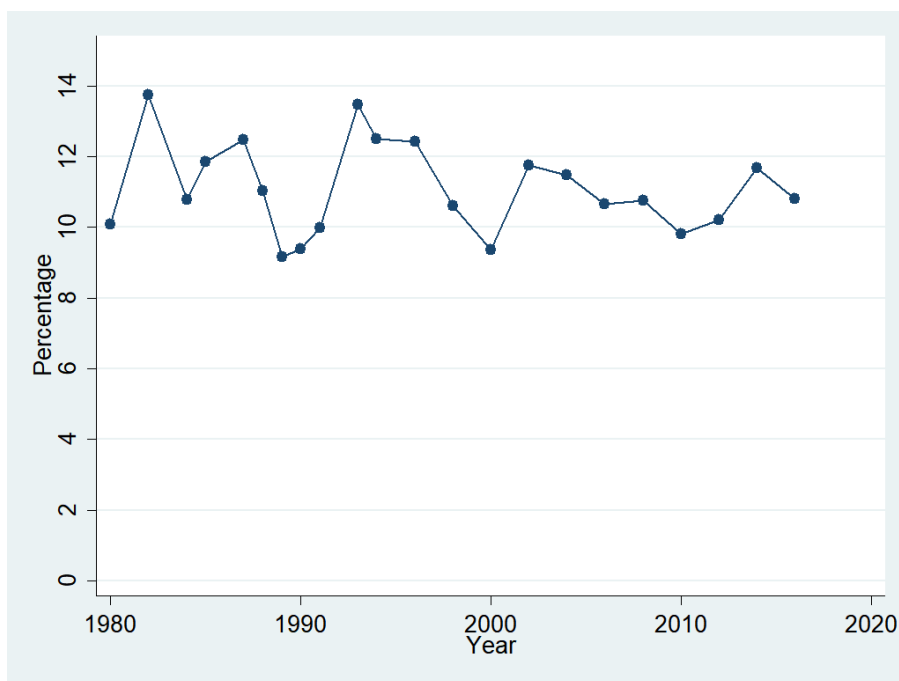


Figure 7: Gun Ownership Among Women, 1973 - 2016.

Crime and Other Factors

Given that a plurality of handgun owners possess handguns for self-defense, it seems likely that handgun ownership in a given time and place is largely determined by the perceived fear of danger there. To track this variable, we examine the GSS question about whether the respondent is afraid of walking around his

¹⁹While part of this could be attributed to non-gun owners self-sorting into urban areas, it is also true that urban jurisdictions tend to have stricter gun laws than rural ones, thereby curtailing ownership among people who may have otherwise had one.

neighborhood at night.²⁰ As one would expect given the large decline in crime that occurred starting in the early 1990s, this measure of fear decreased significantly over a similar period (Figure 8).

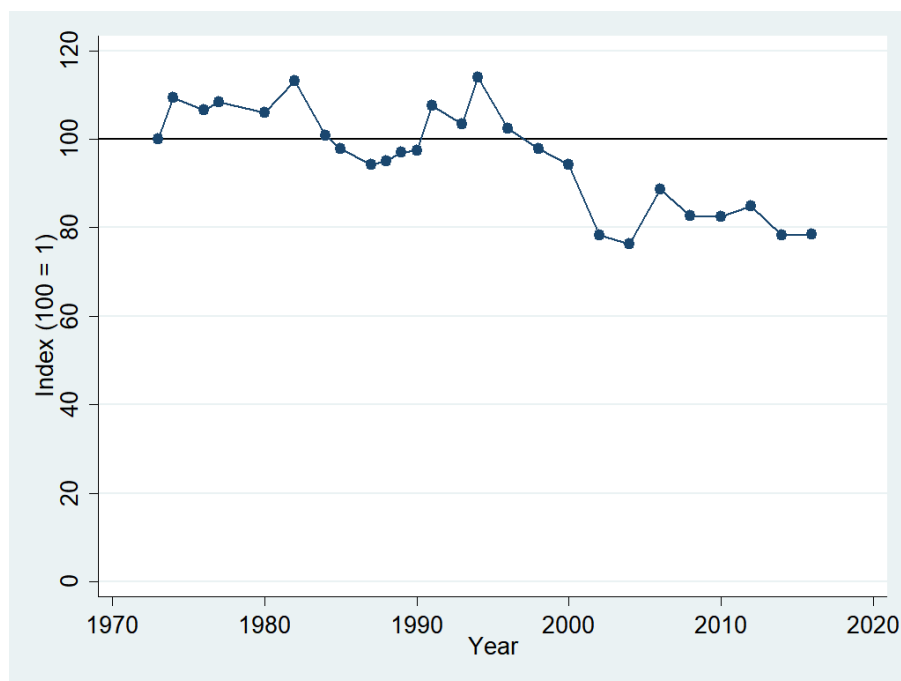


Figure 8: Neighborhood Fear Index.

However, this leaves us with the puzzle of why handgun ownership has remained stable over the study period if crime, as well as the fear resulting from it, have both gone down so dramatically. (Indeed, the decline in hunting also should have contributed to a decrease in handgun ownership.) Going by Figure 9, which plots handgun ownership against the fear rate for each Census Division, it would appear that even within any region, there is no relationship between the two variables. One explanation for this is that we have hitherto ignored (handgun-specific) supply-side dynamics that have served to increase ownership, such as reductions in manufacturing costs or the market becoming less concentrated. The latter is not the case: The Herfindahl-Hirschman Indices for the pistol and revolver markets have not changed significantly since 1986 (Brauer, 2013). The cost explanation is also unlikely, as the price of steel mill products, a strong determinant of costs to gun manufacturers (First Research, 2012), has increased precipitously over the study period, reaching over five times its 1973 level in late-2008 (Bureau of Labor Statistics, 2016). Another possibility is that we have misidentified the direction of causality: Perhaps reduced fear of danger does not significantly reduce the desire to own a handgun, but owning a handgun does reduce one's fear—and this mechanism is prevalent enough to scale up to a general trend. Finally, because much of the wear-and-tear on a firearm occurs through the number of rounds fired, and handguns bought for concealed-carry or home self-defense purposes are not likely to be fired very many times (especially relative to long guns bought for target shooting or hunting), it is plausible that the average handgun would last much longer than the average long gun (perhaps by decades),²¹ resulting in the trends documented above.

²⁰The exact wording is: “Is there any area right around here—that is, within a mile—where you would be afraid to walk alone at night?”

²¹There is little hard data on the life spans of different guns or their determinants, but the bulk of opinions shared on online firearm enthusiast forums suggest that certain parts in every gun need to be replaced after some number of rounds are fired, and that this “round ceiling” is the main limiting factor on a firearm's longevity.

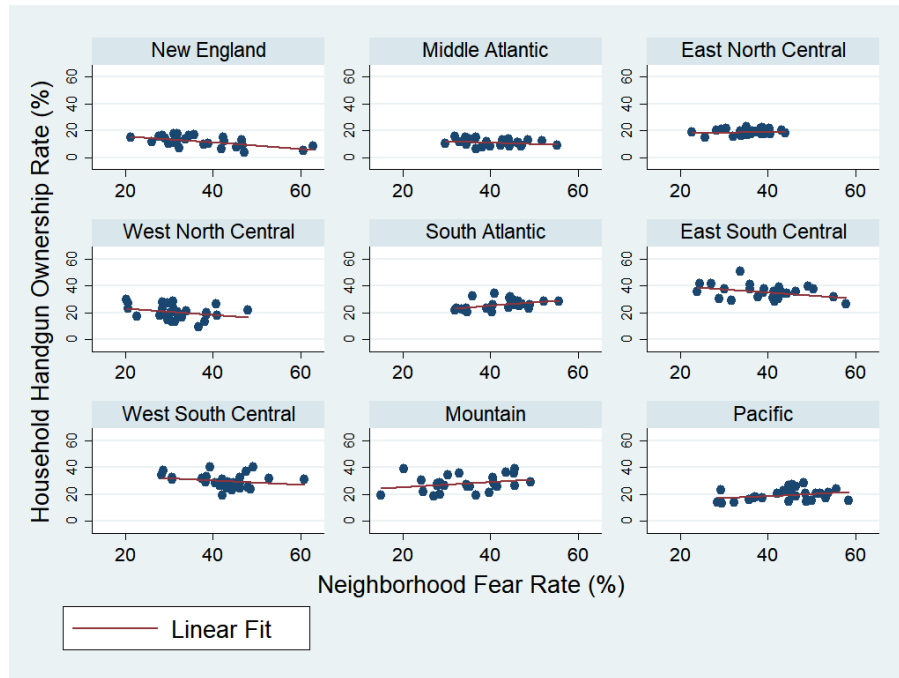


Figure 9: Handgun Ownership and Neighborhood Fear by Census Division. $r = -0.013$

Conclusion

Those advocating weaker regulations on guns often claim that gun ownership has increased substantially since the early 1990s, and that the concurrent drops in violent crime rates can be attributed to this trend (National Rifle Association, 2010). And indeed, the claim that violent crime is down is accurate: From 1990 to 2015, the national murder, aggravated assault, and robbery rates have dropped by roughly 48, 44, and 60%, respectively. However, for the nation as a whole and for 7 of 9 Census Divisions, gun ownership also seems to be down considerably—though those with guns have acquired larger stocks.

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Appendix

Proxy Correlations

Table 2 presents pairwise correlations, at the state, Census Division, and national levels, between the gun ownership proxies and a survey measure of gun ownership. At the state level, proxies are compared to gun ownership as captured by the BRFSS household rate in 2001, 2002, and 2004, while at the Census Division and national levels, the GSS household rate is the survey metric. Because correlations at the state level between our proxies and the BRFSS ownership rate are based on only three years of data, it is important to note that they largely capture inter-spatial, rather than inter-temporal, similarities. The same issue does not exist at the coarser levels, since we have national and Census Division-level ownership rates for many more years.

		GSS	
	BRFSS	FS/S	0.836***
Licenses per Capita	0.792***	Accidental Death Rate	0.830***
NICS Checks per Capita	0.806***	Licenses per Capita	0.694***
FS/S	0.770***	Circulation per Capita	0.576***
		NICS Checks per Capita	0.639***
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$	
(a) State Level		(b) Census-Division Level	
		GSS	
		FS/S	0.822***
		Accidental Death Rate	0.932***
		Licenses per Capita	0.945***
		Circulation per Capita	0.734
		NICS Checks per Capita	-0.422
		* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$	
		(c) National Level	

Table 2: Correlations Between Surveyed Gun Ownership Rates and Proxies.

Regional Trends

One potential objection to our claims would be that the national trends illustrated above mask significant regional heterogeneity. Perhaps it is only in certain areas that the prevalence of long guns has decreased relative to that of handguns, or perhaps the decline in overall ownership is confined to relatively populous regions (whereas other areas have even experienced increases). As it turns out, data at the Census Division level confirm that these patterns are mostly consistent across regions. In Figures 10, 11, and 12 we reproduce three of the previous charts, plotted for each individual Census Division. (Figure 13 is a map of the Divisions.) With the exceptions of two Divisions, it appears that the decreases in access to firearms and interest in hunting, as well as the convergence between handgun and long gun ownership rates, are not limited to a particular area, but are present throughout the country. The exceptions, New England and West North Central, are also the only Divisions for which we also do not observe a downward trend in prevalence.

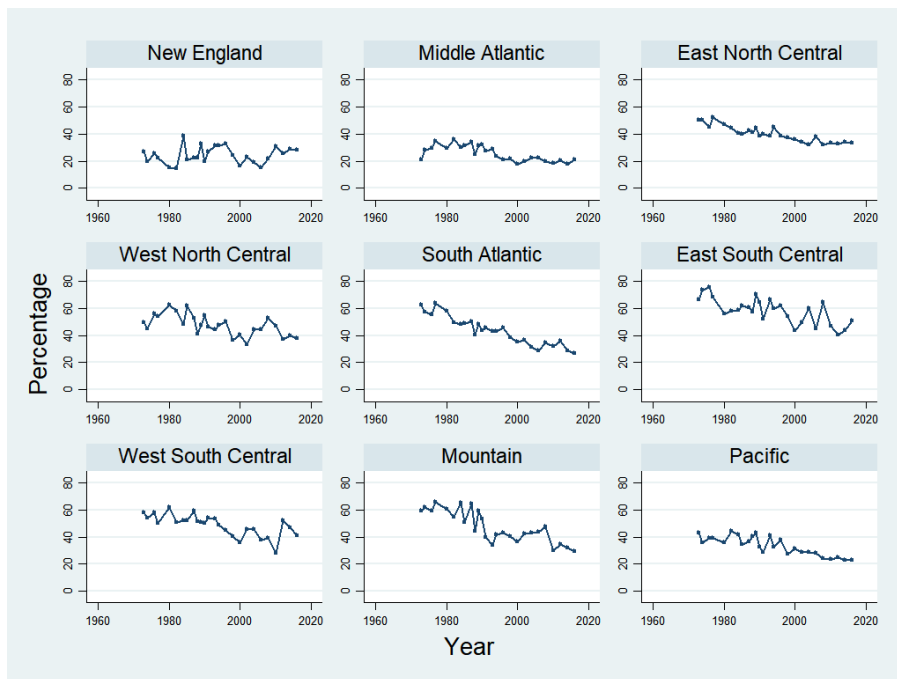


Figure 10: Household Gun Ownership by Census Division, 1973 - 2016.

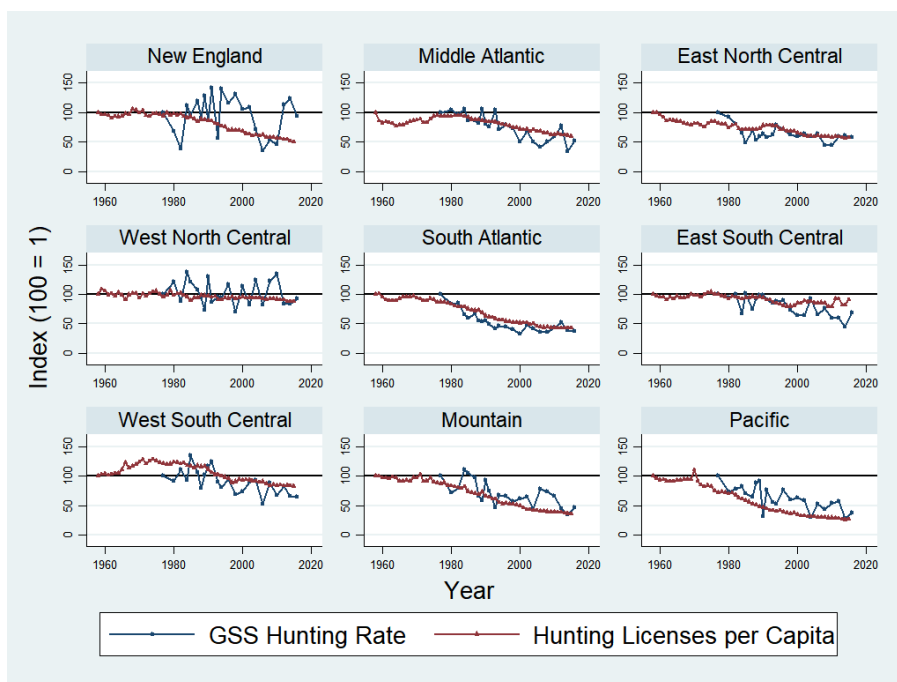


Figure 11: Trends in Hunting by Census Division, 1977 - 2015.

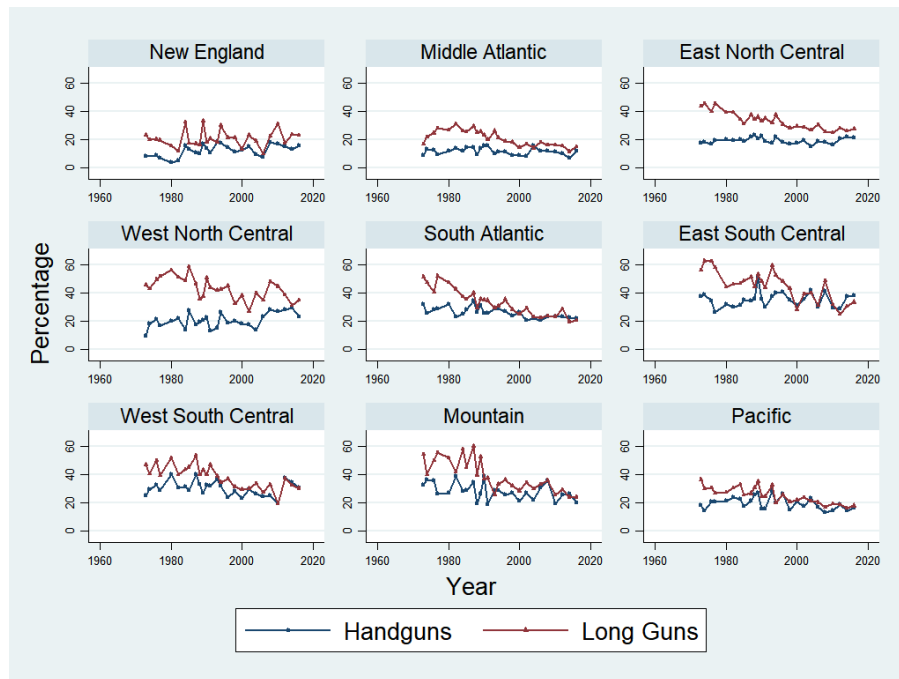


Figure 12: Household Gun Ownership by Type and Census Division, 1973 - 2016.

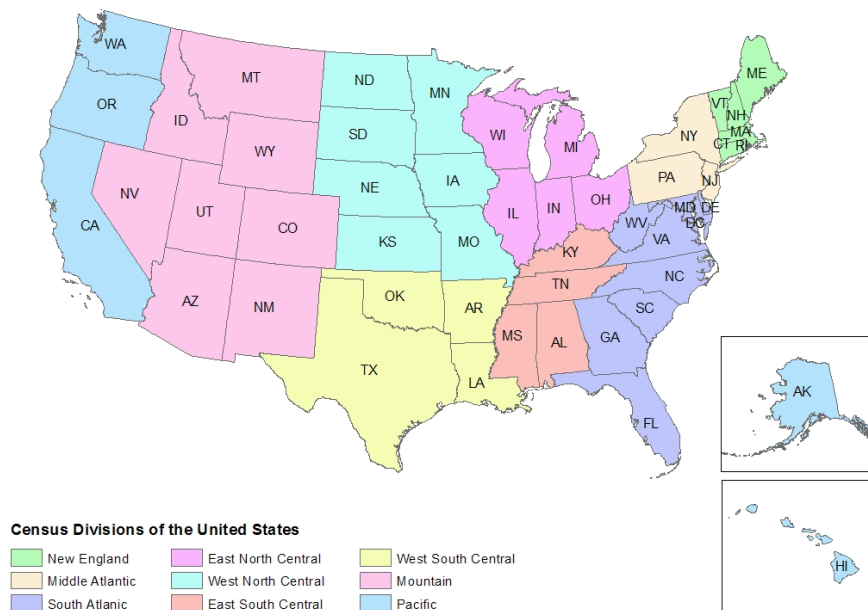


Figure 13: Map of Census Divisions. Courtesy of Iowa State University.

EXHIBIT C

The Stock and Flow of U.S. Firearms: Results from the 2015 National Firearms Survey



DEBORAH AZRAEL, LISA HEPBURN, DAVID HEMENWAY,
AND MATTHEW MILLER

Since the mid-1990s, the U.S. civilian gun stock has grown from approximately 192 million (65 million handguns) to approximately 265 million (113 million handguns). In 2015, gun owners owned more weapons and were more likely to own both handguns and long guns than in 1994. As in 1994, ownership in 2015 was highly concentrated: the median owner owned two, but the 8 percent of all owners who owned ten or more accounted for 39 percent of the stock. Approximately seventy million firearms changed hands within the past five years (from 2011 to 2015); most were purchased. Two and a half percent of Americans had guns stolen within the past five years, accounting for an estimated five hundred thousand guns per year.

Keywords: firearms, guns, gun stock, handguns

In 2015, 36,252 people died of a firearm-related injury in the United States, approximately the same number of deaths as occurred in motor vehicle crashes. The same year, more than eighty thousand people were nonfatally injured (CDC 2017). The distribution of firearm deaths in 2015 is typical of the distribution over

the past several decades: the majority of firearm deaths were suicides (22,018), followed by homicides (13,463) and then unintentional firearm injuries (fewer than one thousand). By contrast, of the more than eighty thousand nonfatal firearm injuries, 60,470 were assault related, 15,928 were unintentional (self or

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© 2017 Russell Sage Foundation. Azrael, Deborah, Lisa Hepburn, David Hemenway, and Matthew Miller. 2017. "The Stock and Flow of U.S. Firearms: Results from the 2015 National Firearms Survey." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 3(5): 38-57. DOI: 10.7758/RSF.2017.3.5.02. This research was supported by grants from the Fund for a Safer Future (New Venture Fund/Fund for a Safer Future: 03272014) and the Joyce Foundation (16-37317). The authors wish to acknowledge our research assistants Joanna Cohen and Vincent Storie, both of whom took the project on with the very highest level of intelligence, curiosity, and care. The survey would have been poorer if not for the GfK's collaboration and professional input. Direct correspondence to: Deborah Azrael at azrael@hsph.harvard.edu, Harvard Injury Control Research Center, Harvard School of Public Health, 677 Huntington Ave., Boston, MA 02115; Lisa Hepburn at lhepburn@gmail.com, Harvard Injury Control Research Center, Harvard School of Public Health, 677 Huntington Ave., Boston, MA 02115; David Hemenway at hemenway@hsph.harvard.edu, Harvard Injury Control Research Center, Harvard School of Public Health, 677 Huntington Ave., Boston, MA 02115; and Matthew Miller at ma.miller@neu.edu, Northeastern University, Bouvé College of Health Sciences, Room 316 Robinson Hall, 360 Huntington Ave., Boston, MA 02115.

other) injuries, and fewer than 3,320 were acts of deliberate self-harm that proved nonlethal.

The firearms involved in these injuries, and the millions more not involved in any injuries, all start out as legally manufactured or imported guns introduced into the primary market through federally licensed dealers. Subsequently, these firearms may exchange hands through private sales, some of which involve federally licensed dealers, or through gifts, inheritance, or nonpurchase transfers such as theft or borrowing, arrangements that characterize the underground gun market (as Cook and Pollack describe in the introduction).

Beyond that, little more is known about these guns than that they are owned by roughly one in five U.S. adults and can be found in approximately one of three U.S. households. In fact, the most recent peer-reviewed nationally representative survey that focused on details about firearms other than these two basic measures of exposure was conducted in 2004 (Hepburn et al. 2007). Between 2004 and today, we know that the proportion of adults who personally own firearms (and the proportion who live in households with guns) has continued to decline, modestly but steadily, largely because of a decline in personal gun ownership by men. In 2014, for example, the National Opinion Research Center's General Social Survey, an annual survey that every other year or so includes the same two questions (about personal and household firearm ownership) estimated that 22 percent of U.S. adults personally owned a firearm (35 percent of men and 12 percent of women) and that 31 percent of American households included at least one firearm, compared with 28 percent of U.S. adults (50 percent of men and 10 percent of women) and 47 percent of U.S. households in 1980 (Smith and Son 2015).

Although the National Opinion Research Center's General Social Survey and other surveys have asked respondents whether they personally own a firearm or live in a home with firearms, few have asked about the *number* of guns respondents own, let alone more detailed information about these firearms and the people who own them, such as reasons for firearm ownership, where firearms were acquired, how much firearms cost, whether they are carried

in public, and how they are stored at home (Smith and Son 2015; Gallup 2016; Morin 2014). Because of this, the best and most widely cited estimates of the number of firearms in civilian hands are derived from two national surveys dedicated to producing detailed, disaggregated, estimates of the U.S. gun stock, one conducted in 1994, the other in 2004 (Cook and Ludwig 1997, 1996; Hepburn et al. 2007). In the 1994 survey, sponsored by the National Institute of Justice, Philip Cook and Jens Ludwig estimated that American civilians owned approximately 192 million firearms, approximately one-third of which (sixty-five million) were handguns. In 2004, using a random-digit dial survey toward the end of an era when most Americans had land lines and answered their telephones, we estimated that U.S. adults owned approximately 283 million firearms (more than four per owner), 40 percent of which were handguns. These two surveys, taken together, suggested several important trends in firearm ownership between 1994 and 2004: a steady increase in the number of firearms in civilian hands, a growing proportion of the U.S. gun stock represented by handguns, and concentration of firearms among fewer gun owners.

Less is known about the movement of firearms between people than about the gun stock. Firearm manufacturing data provide one measure of the annual number of new guns available to be purchased (flow of new guns into the market); other data collected by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) provide a related, but overlapping measure: the annual number of adults who undergo a background check before acquiring (or attempting to acquire) one or more guns. Other movements of firearms, such as dispositions by the police and military, are not centrally recorded (Wright, Rossi, and Daly 1983; Cook and Ludwig 1996). The National Crime Victimization Survey (NCVS) collects information on firearm theft (Langton 2012; Rand 1994). Recent estimates suggest that between 2005 and 2010 approximately 250,000 guns were stolen annually (Langton 2012). No single source provides an estimate of the flow of guns, however. In consequence, as with the gun stock, the best available evidence to date regarding the frequency of gun transfers and

the number of guns transferred comes from the 1994 and 2004 surveys.

To learn more about private ownership and use of firearms in the United States today, as well as to characterize where and the extent to which new and used firearms have exchanged hands over the past five years, we conducted the first nationally representative survey of firearm ownership and use in more than a decade—the 2015 National Firearms Survey (NFS). In this article, we focus on features related to the gun stock (such as its size, composition, and distribution and the reasons for private gun ownership) and on salient aspects of firearm transfers between parties, such as where current firearm owners acquired their most recent firearm, by type of gun and recency of acquisition.

METHODS

Data for this study come from the NFS, a national web-based survey (N=3949) designed by the authors and conducted in January 2015 by the survey research firm Growth for Knowledge (GfK). Respondents were drawn from GfK’s KnowledgePanel (KP), an online panel that includes approximately fifty-five thousand U.S. adults.¹ The KP panel is selected on an ongoing basis, using an equal probability of selection design, to provide samples, after minor adjustments for deviations from equal probability se-

lection (base weights), that are representative of the U.S. population. Prior to selection of a study sample, GfK adjusts panel base weights to account for any discrepancies between panel composition and the distribution of key demographic characteristics of the U.S. population as reflected in the most recent Current Population Survey (GfK 2013).²

KP panel members complete an initial demographic survey and then periodic subsequent surveys, answers to which allow efficient panel sampling and weighting for future surveys. For the NFS, the study target population comprised adults eighteen years or older who fell into one of three groups: gun owners, non-gun owners living in a gun-owning household, or non-gun owners living in a non-gun-owning household, ascertained from the demographic surveys. An additional target population was veterans, who could fall into any of the three groups. To sample this population, GfK targeted respondents who met the criteria in GfK profile surveys and reconfirmed their gun ownership and veteran status within the survey. The final study weights provided by GfK combined pre-sample weights with a set of study-specific poststratification weights accounting for oversampling and for survey non-response.³

For this survey, 7,318 KP panel members received an invitation to participate. Of these,

1. As discussed at greater length later, historically, most estimates of gun ownership come from either random-digit dial telephone surveys or, in the case of the General Social Survey, in-person interviews of respondents. Online panels such as KP have been used increasingly in the social science literature to overcome the cost and response rate limitations of these survey modalities.

2. GfK structures recruitment for the KP with the goal of having the resulting panel represent the adult population of the United States with respect to a broad set of geodemographic distributions including particular subgroups of hard-to-reach adults (for example, those without a landline telephone or those who primarily speak Spanish). Panel members are randomly recruited through probability-based sampling, and participating households are provided with access to the Internet and hardware if needed. GfK recruits panel members by using address-based sampling (previously, GfK relied on random-digit dialing methods). For selection of general population samples from KP, GfK uses an equal probability of selection method design by weighting the entire KP to the benchmarks from the latest March supplement of the U.S. Census Current Population Survey. The geo-demographic dimensions used for weighting the entire KP typically include sex, age, race, ethnicity, education, census region, household income, home ownership status, metropolitan area, and Internet access. Using these weights as the measure of size for each panel member, in the next step a probability proportional to size procedure is used to select study specific samples. Application of the proportional to size procedure methodology with the above measure of size values produces fully self-weighting samples from KP, for which each sample member can carry a design weight of unity.

3. After the study sample was selected and fielded and all of the survey data were edited and made final, design weights were adjusted for any survey nonresponse (to the initial and to the supplemental survey) as well as for

3,949 completed the survey, yielding a survey completion rate of 54.6 percent.⁴ In contrast, nonprobability, opt-in, online panels typically achieve a survey completion rate between 2 percent and 16 percent (Callegaro and DiSogra 2008). All panel members except those serving in the U.S. armed forces at the time were eligible to participate. Invitations to participate were sent by email; one reminder email was sent to nonresponders three days later. Participants were not given any specific incentive to complete this survey, although GfK has a point-based program through which participants accrue points for completing surveys and can later redeem them for cash, merchandise, or participation in sweepstakes. The final sample consisted of gun owners (n=2,072), non-gun owners in gun households (n=861), and non-gun owners (n=1,016). The sample also included 1,044 veterans, distributed across the three gun ownership groups.

Following earlier work, our estimates of the

magnitude and distribution of the U.S. gun stock, as well as gun transfers and theft, come from the reports of those who personally own guns (Cook and Ludwig 1997; Hepburn et al. 2007). Gun owners were identified through two questions: “Do you or does anyone else you live with currently own any type of guns?” followed by, among all respondents who answered in the affirmative, “Do you personally own a gun?” Gun owners were then asked about the types of guns they owned (handguns, divided into pistols and revolvers), long guns, and other guns) and the number of each type. Respondents were also asked about the main reasons they owned guns, as well as about their most recent firearm acquisition, including whether they bought the gun or acquired it in some other way (such as an inheritance), and whether, and if so how many, guns had been stolen from them in the past five years.⁵ Data for this article come from respondents who personally own guns.

any under- or overcoverage imposed by the study-specific sample design. For this study, the following strata of gun ownership from weighted KP data and veteran status from the 2014 veteran supplemental survey of the census Current Population Survey were used for the raking adjustment of weights: gender by age (eighteen to twenty-nine, thirty to forty-four, forty-five to fifty-nine, sixty to sixty-nine, or seventy and older); census region (Northeast, Midwest, South, West) by metropolitan area (yes or no); gender by veteran status (yes or no); age (eighteen to twenty-nine, thirty to forty-four, forty-five to fifty-nine, sixty to sixty-nine, or seventy and older) by veteran status (yes or no); race-Hispanic ethnicity (white or non-Hispanic, black or non-Hispanic, other or non-Hispanic, two or more races and non-Hispanic, Hispanic) by veteran status (yes or no); census region (Northeast, Midwest, South, West) by veteran status (yes or no); metropolitan area (yes or no) by veteran status (yes or no); education (less than high school or high school, some college, bachelor’s or greater) by veteran status (yes or no); household income (less than \$25,000, \$25,000 to less than \$50,000, \$50,000 to less than \$75,000, \$75,000 or more) by veteran status (yes or no); Internet access (yes or no) by veteran status (yes or no); veteran serving year (less than two years, two to three years, four to nine years, or ten or more years); armed services branch (Air Force, Army, Coast Guard or Marines or other, Navy). An iterative proportional fitting (raking) procedure was used to produce final weights aligned with respect to all strata simultaneously. In the final step, calculated weights were examined to identify and, if necessary, trim outliers at the extreme upper and lower tails of the weight distribution. The resulting weights were then scaled to the sum of the total sample size of all eligible respondents.

4. The 55 percent participation rate, according to GfK, is within the expected range for its surveys and does not signal that recruitment for this survey was particularly difficult. We did not add incentives because the participation rate was unexceptional. In surveys of this sort the participation rate can be artificially inflated by waiting a longer time for eligible parties to respond or contacting eligible members of the panel with reminders. We did not need to do so as we hit our target number of participants within a short period.

5. Each gun-owning respondent was asked separately for handguns and long guns: “What are the main reasons you own . . . ?” Response categories were as follows: “1) For protection against strangers; 2) For protection against people I know; 3) For protection against animals; 4) For hunting; 5) For other sporting use; 6) For a collection; 7) For some other reason.” Respondents could check multiple responses and provide a free text answer if they indicated that a main reason for owning guns was “other.” Respondents who reported that they owned other guns were asked to indicate a single primary reason they owned these guns.

A supplement to our survey was conducted by GfK in November 2015. For the supplement, all gun owners from the original survey (n=2072) who were still in the KP panel (n=1880) were invited to answer an additional set of questions about the timing of their most recent gun acquisition, the number of guns they had acquired in the previous five years, and the number of guns stolen from them in the previous five years.⁶

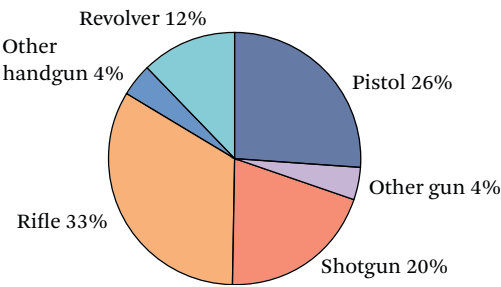
Of those eligible for the survey (n=1,880), 1,613 responded (86 percent). The respondents to the supplemental survey did not differ from respondents to the original survey with respect to age, gender, race, type of gun most recently acquired, or acquisition patterns. Nonresponders (n=267) were more likely than responders to be younger and female and to have acquired their most recent firearm as a gift or inheritance than by purchase. Respondents to the original survey who were no longer in the GfK panel (n=192) were more likely to be younger and have refused to describe the type of gun they most recently acquired than those in the original sample. They were also less likely to have purchased their most recent firearm. These differences did not affect the overall similarities between the supplemental and original samples. We use a supplemental survey weight provided by GfK for analyses using the supplemental survey.

The Northeastern University Institutional Review Board approved this study.

RESULTS

Results from the NFS detail the U.S. gun stock, including its size, distribution, and reasons for gun ownership, as well as gun transfers, including sales and theft.

Figure 1. U.S. Gun Stock by Gun Type



Source: Authors’ tabulations based on the National Firearms Survey.

The Gun Stock

Twenty-two (22) percent of our sample reported that they personally owned a gun. Extrapolating to the U.S. population of adults age eighteen and older (245,157,000 in 2014) (Colby and Ortman 2015), we estimate approximately 54.7 million gun owners in the United States (CI: 50.7–58.8). Sixty respondents who said that they owned guns did not answer our questions about how many guns they owned. We use results from the 2012 respondents who did provide an answer to estimate the mean number of guns owned by gun owners: 4.8 (CI: 4.37–5.32), yielding a gun stock of 265 million (CI: 245 million to 285 million).⁷

Number and Types of Guns in U.S. Gun Stock

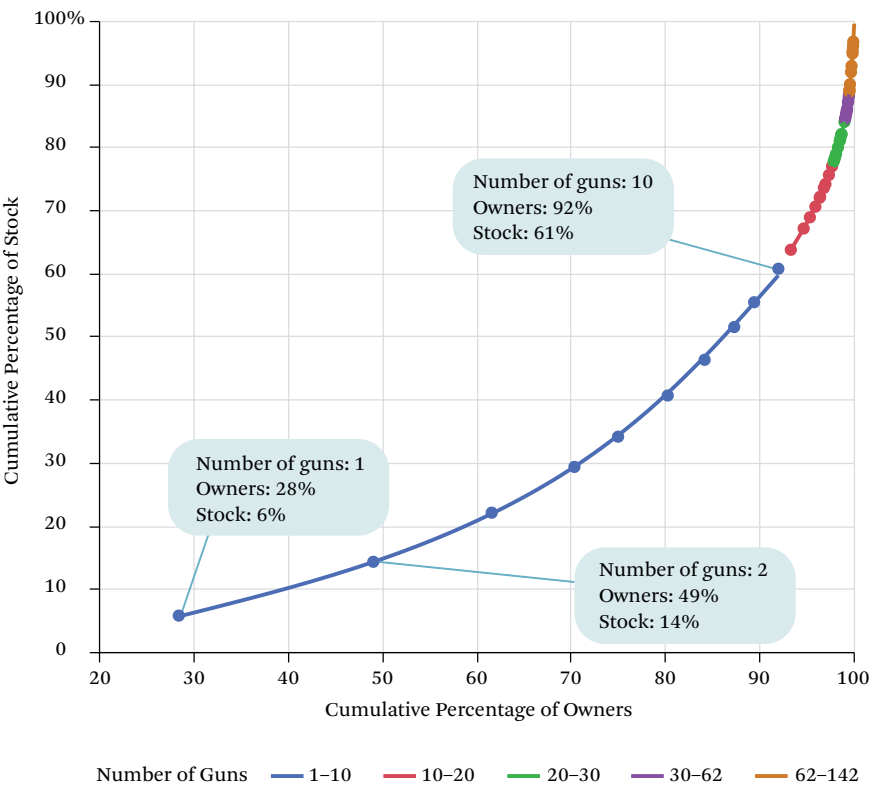
Of the estimated 265 million guns in civilian hands in the United States, approximately four in ten (42 percent) are handguns, the remainder primarily (53 percent) long guns (4 percent are “other” guns).⁸ Among handguns, the majority are semiautomatic pistols (62 percent) and revolvers (29 percent); the remainder are described by respondents as “other” hand-

6. Respondents were asked “When you completed the prior national firearms survey, sponsored by Northeastern University, in April 2015, you said that the gun you acquired most recently was a [insert type based on type noted in the April 2015 survey]. Thinking about this gun, approximately when did you acquire it?” Three options were offered: “1) Within the past two years; 2) Between two and five years ago; 3) More than five years ago.” The second question was “What was the exact year that you acquired this gun?” Respondents were asked to specify the exact year or to report that they did not know what year.

7. Including or excluding those who reported being a gun owner but reported owning no guns, or calculating the mean number of guns per gun owner including those who reported owning no guns, does not materially change our estimates (21.8 percent personal gun ownership; mean number of guns, 4.7).

8. We did not ask respondents to specify what type of gun. Other guns might include single-shot “black powder” guns or machine guns.

Figure 2. Cumulative Distribution of Gun Stock



Source: Authors’ tabulations based on the National Firearms Survey.

guns. Approximately six in ten long guns (62 percent) are rifles and four in ten (38 percent) are shotguns (see figure 1).

Distribution of Gun Ownership

Gun-owning respondents owned an average of 4.8 firearms (range: 1 to 140); the median gun owner reported owning approximately two guns. As seen in figure 2, approximately half (48 percent) of gun owners report owning one or two guns, accounting for 14 percent of the total U.S. gun stock, while those who own ten or more (8 percent), own 39 percent. Put another way, half of the gun stock (approximately 130 million guns) is owned by approximately 86 percent of gun owners, and the other half

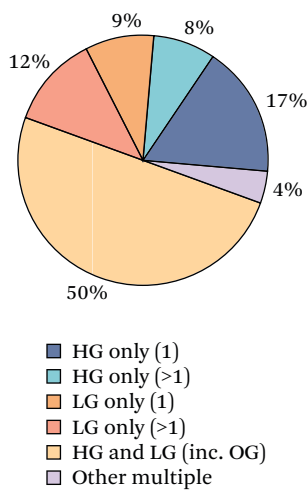
is owned by 14 percent (14 percent of gun owners equals 7.6 million adults, or 3 percent of the adult U.S. population).⁹

Distribution of Gun Ownership, by Gun Type

Although the majority of guns in the U.S. gun stock are long guns, in terms of the distribution of gun types, only one in five gun owners (21 percent) own long guns only, 25 percent of gun owners own handguns only (2 percent report own “other guns” only), and half of gun owners own both handguns and long guns (44 percent) or handguns, long guns, and other guns (6 percent). The remainder of gun owners (4 percent) reported owning either “other guns” along with handguns or long guns, or

9. About one quarter (22 percent) of gun owners reported that one of the primary reasons they owned a firearm was as part of a collection, although the large majority of those who cited owning guns for a collection also cited other reasons for owning (for example, 72 percent of collectors also said they owned guns for protection). Not surprisingly, gun collectors owned more guns than those who do not collect guns (ten versus three guns), and gun collectors accounted for most of the upper range of number of guns owned (noncollectors owned one to forty-three guns; collectors owned between one and 140).

Figure 3. U.S. Gun Ownership by Number and Type of Firearm



Source: Authors’ tabulations based on the National Firearms Survey.

did not specify.¹⁰ Among those who own handguns only, two-thirds (67 percent) own one gun; for those owning long guns only, 43 percent own only a single gun (see figure 3).

Distribution of Gun Ownership by Gun Owner Demographics

Table 1 describes the demographic characteristics of respondents who own handguns only, long guns only, and both handguns and long guns (for simplicity of presentation, it does not include the small number of respondents (ninety-one) who are not in one of these three categories). The demographic characteristics of gun owners have been well established in multiple surveys. Consistent with these surveys, we find that gun owners overall are disproportionately male, white, older, non-urban, and from the South.

Differences among gun owners emerge, however, when those who own handguns only and those who own long guns only are compared with those who own both types. Handgun-only owners, in particular, appear to be a distinct group: they are more likely to be female, nonwhite, and living in urban areas, and are less likely to have grown up in a house

with a gun compared to other gun owners. For example, whereas approximately 20 percent of long gun owners are female, among gun owners who own handguns only, 43 percent are women, versus 13 percent of long gun owners and 14 percent of those who own both.

Reasons for Gun Ownership

Almost two in three gun owners (63 percent) reported that one of the primary reasons they own their guns is for protection against people (not shown). Three-quarters of handgun owners (76 percent) reported that they owned one primarily for protection (not shown). Other reasons include hunting (40 percent), collecting (34 percent), sporting use (28 percent), protection against animals (20 percent), and some other reason (40 percent). Other reasons volunteered by respondents included gift or inheritance or the right to have them (see table 2).

Reasons for ownership varied significantly depending on the types of guns respondents owned (handguns only, long guns only, or both) and demographic characteristics. Overall, those who own only handguns or both handguns and long guns were similar to one another with respect to protection, whereas those who own only long guns and those who own both were similar with respect to hunting and sporting use. For example, almost 80 percent of people who own handguns cite protection against strangers as a reason for ownership, as do 72 percent of those who own both handguns and long guns, but only 31 percent of those who own only long guns do. Likewise, 2 percent of those who only own handguns report that hunting is a primary reason for gun ownership, while 57 percent of those who only own long guns and 55 percent of those who own handguns and long guns do.

Across demographic characteristics, female gun owners were more likely than their male counterparts to report owning any gun for protection and less likely to report owning a gun for any other reasons (see table 2). Reasons for ownership were relatively consistent across age groups, although owning a gun for protection was less common among older gun owners,

10. Other guns may include single-shot black powder guns or machine guns.

Table 1. Demographic Characteristics of Gun Owners

Demographic (Percent Total Survey Population)	Any Firearm	Handgun Only	Long Gun Only	Both
All respondents	22	6	5	11
Age				
Eighteen to twenty-nine (19.1)	13	3	4	6
Thirty to forty-four (23.5)	21	6	4	10
Forty-five to fifty-nine (28.2)	24	6	5	13
Sixty or older (29.2)	25	6	5	14
Sex				
Male (48.3)	32	7	8	18
Female (51.7)	12	5	2	5
Race				
White (70.5)	25	5	6	13
Hispanic (11.7)	16	6	3	7
Black (11.0)	14	8	1	5
Multiracial (1.4)	25	4	6	15
Other (5.5)	8	3	<1	5
Marital status				
Married (54.0)	26	6	6	14
Never married (23.6)	12	3	3	5
Divorced (9.2)	23	6	5	12
Living with partner (6.9)	19	6	4	9
Widowed (5.4)	21	5	4	12
Separated (1.0)	24	14	2	8
Community				
Urban (23.0)	15	6	3	7
Suburban (50.3)	19	6	4	10
Rural (26.1)	33	5	9	19
Education				
Less than high school (10.5)	11	4	3	5
High school (29.5)	23	6	5	12
Some college (28.6)	26	6	5	15
College (31.4)	20	5	5	10
Annual income				
Less than 25,000 (16.9)	13	4	3	6
25,000–59,999 (29.2)	22	6	5	11
60,000–99,999 (27.6)	24	7	4	12
100,000 or more (26.3)	25	5	6	14
Military service				
Veteran (9.7)	44	10	9	25
Non-veteran (90.3)	19	5	4	10
Political views				
Liberal (20.2)	14	5	3	7
Moderate (46.3)	19	6	4	9
Conservative (31.5)	30	6	7	17

(continued)

Table 1. (continued)

Demographic (Percent Total Survey Population)	Any Firearm	Handgun Only	Long Gun Only	Both
Region				
Northeast (18.3)	15	3	4	7
Midwest (22.4)	23	4	6	12
South (36.9)	25	8	4	13
West (22.4)	20	5	4	11
Child under eighteen				
Yes (29.8)	19	5	7	9
No (70.2)	23	6	5	12
Grew up with a gun				
Yes (47.5)	35	7	8	20
No (48.0)	9	4	2	3
Don't know (3.2)	17	9	4	4

Source: Authors' compilation based on the National Firearms Survey.

Note: Reported values are percentage of respondents indicating ownership of the specified firearm.

Table 2. Given Reasons for Gun Ownership

	Protection From		Hunting	Other Sporting	Collection	Other
	People	Animals		Use		
Gun type						
Handgun only, 1	0.78	0.10	0.03	0.00	0.16	0.03
Handgun only, >1	0.83	0.12	0.01	0.00	0.18	0.01
Long gun only, 1	0.36	0.14	0.46	0.17	0.11	0.46
Long gun only, >1	0.27	0.20	0.65	0.41	0.21	0.65
Handgun and long gun	0.72	0.27	0.55	0.47	0.36	0.55
Sex						
Male	0.60	0.20	0.49	0.32	0.37	0.44
Female	0.69	0.21	0.32	0.21	0.28	0.32
Age						
Eighteen to twenty-nine	0.60	0.21	0.38	0.26	0.39	0.38
Thirty to forty-four	0.67	0.18	0.41	0.30	0.38	0.41
Forty-five to fifty-nine	0.65	0.24	0.41	0.27	0.33	0.41
Sixty or older	0.58	0.18	0.41	0.29	0.32	0.41
Census region						
Northeast	0.53	0.18	0.40	0.29	0.37	0.40
Midwest	0.55	0.16	0.51	0.38	0.36	0.51
South	0.73	0.23	0.37	0.25	0.28	0.37
West	0.56	0.18	0.35	0.25	0.42	0.35

Source: Authors' tabulations based on the National Firearms Survey.

and more common among those from the South.

Gun Transfers

In addition to characterizing the stock of firearms in civilian hands, our survey provided information on the flow of guns in the United States over the past five years, including gun acquisitions, dispositions, and theft.

Firearms Acquisitions

We asked current gun owners a series of questions about the firearm they had acquired most recently. Approximately half said within the past five years (28 percent within the past two years, 21 percent between three and five years ago) and half (50 percent) more than five years ago (see tables 3, 4, and 5). Extrapolating to the U.S. population, we estimate that U.S. firearm owners acquired approximately seventy million guns in the past five years.¹¹

The large majority of gun owners purchased their most recently acquired gun, with purchase more common for guns acquired in the past one to two years (86 percent) than for those acquired more distally (79 percent two to five years ago, 61 percent more than five years ago). Across all three periods, the most commonly acquired firearm was a handgun, with handguns constituting almost six of ten guns acquired in the past five years, and five of ten guns acquired more than five years ago. Stores (gun

stores, sporting good stores, and so on) were the most common source of purchased guns, while gifts and inheritance were the most common form of nonpurchase transfer.

Firearms most recently acquired by gun owners tended to be new rather than used (see tables 6, 7, and 8). The proportion of new guns was higher among those acquired more recently; used guns account for four of ten firearms acquired more than five years ago, but only three of ten acquired in the past two years. The majority of new guns were purchased (89 percent in the past two years, 91 percent two to five years ago, 78 percent more than five years ago). Among used guns, nearly six of ten acquired more than five years ago were not purchased, versus only one-third of those acquired within the past two years. Inherited guns constitute 40 percent of used guns acquired more than five years ago, but only 16 percent of those acquired in the past two years, mirroring a decrease in the overall share of guns obtained by inheritance from 21 percent of those acquired more than five years ago to 4 percent of those acquired in the past two years.

The cost of the most recent firearm purchased (among respondents whose most recently acquired gun was purchased) was relatively evenly distributed around the mode of \$250 to \$500 (see table 9). Overall, used guns were less expensive than new guns and guns acquired longer ago were less expensive than

11. The NFS asked respondents who reported that they were current gun owners to describe when they acquired their most recently acquired firearm still in their possession and, separately, how many guns they had acquired in the past five years (regardless of whether those guns were still in their possession). Some respondents reported that they had acquired one or more guns during the past five years even though they had previously indicated that their most recent firearm acquisition (among the guns they currently owned) took place more than five years ago. Overall, when directly asked when they had most recently acquired a gun in their possession, 49 percent of people reported doing so within the past five years, whereas 62 percent said that they had acquired one or more firearms in the past five years when prompted to provide the number of firearms acquired (irrespective of whether those guns were still in their possession). In estimating that seventy million firearms were acquired over the past five years, we privileged the stem question to mitigate the well-established phenomenon of telescoping (that is, we excluded from our five-year estimate the 23 percent of respondents who reported acquiring at least one gun in the past five years yet also indicated their last acquisition was more than five years ago) (see table A1). Including respondents who initially reported that their most recent acquisition was more than five years ago increases our estimate of the total number of guns acquired over the past five years to eighty-five million. One possible explanation for this discrepancy is the tendency to telescope, which may have inflated the latter estimate. Alternatively, since only the second question explicitly asked respondents to consider guns that are no longer in their possession, these guns may have been excluded when respondents considered the first question.

Table 3. Distribution of Where Current Owners Acquired Most Recent Firearm, Less Than Two Years (28 Percent)

	All Guns (100%)	Handguns (59%)	Long Guns (40%)
Percent purchased at or from			
Any store	62	65	54
Family	2	3	1
Friend or acquaintance	6	6	7
Gun show	4	3	5
Pawn shop	5	4	6
Online	2	2	2
Other	3	3	4
All purchased firearms	84	86	79
Percent nonpurchased transfers			
Gift	8	8	9
Inheritance	4	3	8
Trade	0	0	0
Other	5	4	6
All nonpurchased firearms	17	15	23
All transfers	100		

Source: Authors’ tabulations based on the National Firearms Survey.

Table 4. Distribution of Where Current Owners Acquired Most Recent Firearm, Two to Five Years Prior (21 Percent)

	All Guns (100%)	Handguns (60%)	Long Guns (39%)
Percent purchased at or from			
Any store	54	48	58
Family	3	2	4
Friend or acquaintance	9	11	8
Gun show	3	4	2
Pawn shop	6	7	3
Online	1	1	2
Other	3	3	4
All purchased firearms	79	76	81
Percent nonpurchased transfers			
Gift	11	16	8
Inheritance	8	6	9
Trade	1	0	0
Other	1	2	6
All nonpurchased firearms	21	24	19
All transfers	100		

Source: Authors’ tabulations based on the National Firearms Survey.

Table 5. Distribution of Where Current Owners Acquired Most Recent Firearm, More Than Five Years Prior (50 Percent)

	All Guns (100%)	Handguns (51%)	Long Guns (48%)
Percent purchased at or from			
Any store	42	42	42
Family	3	2	3
Friend or acquaintance	7	9	5
Gun show	2	3	2
Pawn shop	3	4	2
Online	<1	1	0
Other	3	4	2
All purchased firearms	61	65	57
Percent nonpurchased transfers			
Gift	15	13	15
Inheritance	21	17	25
Trade	0	0	1
Other	3	4	2
All nonpurchased firearms	39	34	43
All transfers	100		

Source: Authors’ tabulations based on the National Firearms Survey.

Table 6. Percentage of Where Current Owners’ Most Recent Transfer Occurred, Less Than Two Years (28 Percent)

	Percent Transfers (100%)	New (71%)	Used (26%)
Percent purchased at or from			
Any store	62	78	16
Family	2	0	6
Friend or acquaintance	6	1	19
Gun show	4	3	6
Pawn shop	5	2	11
Online	2	1	5
Other	3	3	4
All purchased firearms	84	89	67
Percent nonpurchased transfers			
Gift	8	6	12
Inheritance	4	0	16
Trade	0	0	0
Other	5	5	5
All nonpurchased firearms	17	11	33
All transfers	100		

Source: Authors’ tabulations based on the National Firearms Survey.

Table 7. Percentage of Where Current Owners' Most Recent Transfer Occurred, Two to Five Years Prior (21 Percent)

	Percent Transfers (100%)	New (61%)	Used (37%)
Percent purchased at or from			
Any store	54	79	10
Family	3	1	6
Friend or acquaintance	9	1	23
Gun show	3	3	3
Pawn shop	6	3	10
Online	1	1	2
Other	3	3	2
All purchased firearms	79	91	56
Percent nonpurchased transfers			
Gift	11	9	20
Inheritance	8	0	20
Trade	1	0	1
Other	1	1	0
All nonpurchased firearms	21	10	41
All transfers	100		

Source: Authors' tabulations based on the National Firearms Survey.

Table 8. Percentage of Where Current Owners' Most Recent Transfer Occurred, More Than Five Years Prior (50 Percent)

	Percent Transfers (100%)	New (71%)	Used (26%)
Percent purchased at or from			
Any store	42	69	9
Family	3	0	6
Friend or acquaintance	7	1	15
Gun show	2	3	2
Pawn shop	3	1	5
Online	1	1	0
Other	3	4	3
All purchased firearms	61	78	40
Percent nonpurchased transfers			
Gift	15	14	15
Inheritance	21	3	41
Trade	0	0	1
Other	3	3	2
All nonpurchased firearms	39	20	59
All transfers	100		

Source: Authors' tabulations based on the National Firearms Survey.

Table 9. Cost of Purchased Firearms, in U.S. Dollars

	\$0–99	\$100–249	\$250–499	\$500–999	\$1,000 or more
All	4.2	18.0	48.1	25.1	4.6
Handguns	3.1	14.3	50.3	29.6	2.7
Long guns	5.1	22.8	45.4	19.3	7.5
New	2.5	14.3	49.9	28.0	5.3
Used	9.1	29.1	41.9	17.3	2.7
Five years or less	2.3	11.6	48.6	30.2	7.4
More than five years	6.9	26.1	46.7	18.6	1.7
Protection from strangers	3.6	15.3	51.0	27.1	3.1
Hunting	4.2	24.5	45.7	18.9	6.7
Sport shooting	6.7	15.3	48.9	25.2	5.0
Collection	2.6	17.7	42.4	28.2	9.0

Source: Authors' tabulations based on the National Firearms Survey.

Note: All figures in percentages.

those purchased more recently. The most commonly cited reason for buying a firearm was self-protection, a reason more common for those purchased within the last five years (43 percent) than more than five years ago (35 percent).

Firearm Dispositions

Approximately 5 percent of gun owners reported that they had sold or otherwise gotten rid of a gun in the past five years (the average number of guns disposed of was two). Of these, the large majority (71 percent) had sold the gun they disposed of most recently, 13 percent had given the gun as a gift, and 10 percent had traded it for something else. A few who had disposed of a gun (1 percent) reported having gotten rid of it in a buy-back program. When gun owners sold guns, they most often sold them to a friend directly (35 percent) or to a gun dealer (32 percent), 12 percent reporting that they had sold the gun via an online advertisement and another 14 percent having sold it to a family member (not shown).

Firearm Theft

Approximately 2.4 percent of gun owners (CI: 1.6–3.6) reported having had one or more stolen from them in the past five years, the mean number at 1.9 (a range of 1 to 6). Assuming that theft was evenly distributed across the years, we estimate that approximately 2.3 million

guns were stolen over the past five years (five hundred thousand annually).

DISCUSSION

In 1994, when the National Survey of Private Ownership of Firearms (NSPOF) was conducted, Philip Cook and Jens Ludwig estimated an approximate 192 million guns in the hands of U.S. civilians (1997). In 2015, we estimate that that number has grown by more than seventy million to approximately 265 million. The guns acquired over the past twenty years are disproportionately handguns, the share of which in the total gun stock is now 42 percent, versus approximately 33 percent in 1994.

The shift we observe in the gun stock toward a greater proportion of handguns may reflect the decline in hunting and a change in motivations for firearm ownership and use (Smith 2001). Indeed, a perceived, and growing, need for self-protection appears to drive contemporary gun ownership in the United States (Pew Research Center 2013). Consistent with our finding that the majority of the guns that have been added to the gun stock are handguns and that gun owners in 2015 were more likely than gun owners in 1994 to report that they owned any handgun primarily for self-protection (76 percent versus 48 percent), we find that almost 70 percent of gun owners report that a primary reason for owning a gun is protection against people. Consistent with this

trend, we find that respondents who owned only handguns were just as likely to live in an urban environment as a rural one, and to be demographically more diverse than owners of long guns (who, as a group, are more likely to be white, male, and rural).

Not only are there many more guns overall, there are also more gun owners (approximately 55 million from the NFS compared to approximately 44 million from the NSPOF), although the percentage of the adult population that owns guns has declined from 25 percent in the 1994 NSPOF (no confidence interval provided), to 22 (CI: 21–24) percent in 2015.¹² Indeed, gun owners today each own, on average, more guns (4.8 in the NFS versus approximately 4.3 in the NSPOF). Moreover, gun ownership appears to be somewhat more concentrated in 2015 than it was in 1994: the top 20 percent of gun owners owned 55 percent of the gun stock in 1994; they now own 60 percent.

In the absence of a gold standard against which to compare our estimates (of the sort that would render survey-based estimates largely unnecessary), two sources of administrative data—from the ATF and FBI—provide an opportunity to grossly validate results (ATF 2015; FBI 2016). Firearm manufacturing and import-export data available from the ATF suggest that, from 1899 through 2013 (the last year for which data are available), approximately 363 million firearms have been available for sale in the United States (see table A1).¹³ Although guns are highly durable, it is reasonable to ex-

pect that every year some fraction is permanently removed from the marketplace through seizure, irrecoverable loss, or breakage. Following Cook, applying a 1 percent per year depreciation (permanent removal from use) rate to the available manufacturing data yields an estimated gun stock in 2013 of approximately 270 million (Cook 1993; Cook and Goss 2014). Assuming the number of guns was added to the market in 2014 (the last full year before our survey) was the same as the number added in 2015 (sixteen million, the largest number of guns manufactured or imported in U.S. history), the estimate of the U.S. gun stock (using the ATF data) increases to 285 million, close to the 265 million we estimate from our survey.¹⁴

Our estimate that approximately seventy million firearms changed hands within the past five years is also broadly consistent with estimates derived separately using—first—ATF data on firearm manufacturing, imports, and exports (which should track our estimates of new firearms acquired), and—second—National Instant Criminal Background Check System (NICS) background check data (which should correspond to the number of people who acquired firearms and underwent a background check). Given the percentage of people in the NFS who report that their most recently acquired gun was new (rather than used) and assuming that new guns correspond to the firearms that the ATF report enumerates, the total number of firearms acquired over the past five years should be approximately eighty-two mil-

12. A similar decline has been reported from the General Social Survey, in which personal gun ownership declined from 28 percent in 1994 to 22 percent in 2014 (Smith and Son 2015).

13. The data series presented in table A1 combines a summary (1899–1968), assembled from ATF reports on manufacturing plus imports (Newton and Zimring 1968), ATF data compiled by Gary Kleck (1969–1986, 1991), and the remainder from online ATF data (ATF 2015).

14. The NSPOF estimate of 192 million guns in 1994 is also remarkably consonant with ATF data up to 1994, applying the same 1 percent annual removal from market estimate. However, our estimate is 30 percent, not 15 percent lower than ATF figures. The estimate of approximately 270 million guns from our 2004 random digit dial telephone survey, appears to be an overestimate. Extrapolating from surveys to the U.S. population, especially for relatively rare events (such as owning an extremely large number of guns), has been shown to have the potential to lead to large overestimates. In the 2004 survey, two factors came into play: first, by 2004 RDD surveys were increasingly plagued, as our survey was, by low response rates, suggesting the possibility that even with the application of poststratification weights, results may not have been generalizable (and thus suitable for extrapolation) to the U.S. population. Second, because ownership of large numbers of guns is relatively uncommon, our estimates of the gun stock were sensitive to the inclusion (or exclusion) of respondents who reported that they owned large numbers of guns.

lion.¹⁵ Our estimates based on ATF data may be an underestimate because they were calculated based on commerce data from a five-year period ending in 2013, the most recent year for which ATF data were available (and sales have been accelerating upward). Nonetheless, our estimates using NICS data are remarkably similar: eighty-three million (derived using our published finding that approximately 75 percent of gun owners who acquired their most recent firearm within the past five years underwent a background check for that acquisition, not shown).¹⁶

Our estimate of the number of guns stolen annually also squares well with external data sources, although our estimate that five hundred thousand guns are stolen annually is somewhat higher than the most recent gun theft estimate (233,000) reported from the NCVS. Overall, however, the number of guns stolen appears to have remained relatively stable over time. In the late 1980s, the NCVS estimated that approximately 340,000 firearms were stolen each year. Using data from the NSPOF, combined with data from a state-level survey that estimated the number of guns stolen per theft incident in that state, Cook and Ludwig estimate that slightly fewer than five hundred thousand guns per year were stolen in the United States in the mid-1990s.

The NFS used an existing probability-based online panel (KnowledgePanel) to examine U.S.

gun ownership, whereas our 2004 survey and the NSPOF both relied on random digit dialing. It is possible that online panel surveys and random-digit dial (RDD) surveys elicit systematically different responses from survey participants, suggesting that comparisons over time (and across survey modes) should be undertaken with some caution. Even if it were possible (or desired) to conduct an RDD survey about gun ownership today, such a survey would be unlikely to be comparable to surveys from 1994 or 2004 due to increasingly poor response rates on telephone surveys (Link et al. 2008). Moreover, probability-based online samples have been found to reduce social desirability bias and yield more accurate results than telephone surveys (Chang and Krosnick 2009).

Although the NFS is thus likely to produce a good estimate of firearms in civilian hands, as well as to accurately characterize the flow of guns and other characteristics of gun ownership, some gun owners may nevertheless have chosen not to report their gun ownership on a survey, and some non-gun owners may have reported owning guns when in fact they do not. What evidence there is, however, suggests that gun owners appear to respond accurately with respect to their firearm ownership on surveys. Studies that have validated survey reports of gun ownership against administrative data have reported low levels of

15. Missing answers as to whether the most recently acquired gun was new (as opposed to used) were imputed, based on the assumption that the 3 percent of respondents with missing data with respect to whether their most recently acquired firearm was new or old, were missing at random. The estimate we arrive at using ATF data is higher (ninety-one million versus seventy million) if we do not restrict respondents to those who indicated in a stem question that they had acquired the last firearm currently in their possession within the past five years. The reason for this is that some of these respondents indicated that they had acquired a nonzero number of firearms in the past five years when asked directly how many firearms they had acquired regardless of whether they still had the firearm in their possession. Incorporating these respondents' answers into our estimate of the gun flow increased the estimate we arrived at using ATF data because the flow of all guns (both new and used) is derived by dividing the ATF enumeration of new guns by the percentage of new guns that our respondents reported were acquired in the past five years (and, ignoring the stem question restriction decreased the percentage of new guns from 68 percent to 62 percent).

16. If respondents were not required to indicate in the stem question that their most recently acquired firearm was acquired within the past five years, 69 percent of gun owners reported having undergone a background check with respect to their most recently acquired gun (and therefore the estimate of the number of firearms acquired over the past five years increases to ninety-one million). This number is likely to be an underestimate given that each NICS background check may result in the acquisition of more than one firearm (for additional details regarding background check data, see Miller, Hepburn, and Azrael 2017).

false negative reports (approximately 10 percent), and virtually no false positive reports (Kellermann et al. 1990; Rafferty et al. 1995). In the NFS, fewer than 1 percent of respondents refused to answer our stem question about household gun ownership, and none refused the subsequent question regarding whether they personally owned a gun. Nonetheless, it is likely that some groups of gun owners (such as those who possess firearms illegally, such as someone with a felony conviction), are not reflected in our estimates, and possible that nonresponse to some questions may affect the validity of our findings if those choosing not to answer a question differed systematically from those who did. Given that 2 percent or fewer of respondents refused to answer the vast majority of our questions about firearms, nonresponse bias among those in our survey is unlikely to have had a material influence on our findings.

CONCLUSION

As of 2015, we estimate approximately 265 million guns in the U.S. civilian gun stock, an increase of approximately seventy million guns since the mid-1990s. Over that time, the proportion of handguns in the gun stock—most often bought for self-protection—has grown (to more than 40 percent), as has the proportion of gun owners who own both handguns and long guns (to more than 75 percent). Although the proportion of U.S. adults who report owning guns has declined only modestly, from 25 percent in 1994 to 22 percent in 2015, fewer men own them (32 percent in 2015 versus 42 percent in 1994), slightly more women do (12 percent in 2015 versus 9 percent in 1994), and owners in general are more likely to have

more guns (the mean number increased from four to five). Despite the increase in the average number of guns, the median owner owns only two (28 percent own one and 31 percent own two, accounting for 14 percent of the total U.S. stock); the 8 percent of all owners who own ten or more account for 39 percent of the gun stock (and 14 percent of owners own half the U.S. stock).

With respect to firearm transfers, we estimate that approximately seventy million firearms changed hands within the past five years, a number broadly consistent with manufacturing data from the ATF, the large majority of which were purchased, more so in the past two years (86 percent) than for those acquired more remotely (79 percent two to five years ago; 61 percent more than five years ago). Across all three periods, the most commonly acquired firearm was a handgun.

Guns not only move into but also out of the hands of owners. Five percent of gun owners in our sample reported having disposed of a gun within the past five years, most often (35 percent) through a sale to family or friends. Another 2.4 percent report having had a gun stolen within that time, accounting for an estimated five hundred thousand guns per year.

The National Firearms Survey provides the first nationally representative data about the stock and flow of guns in the United States since 2004 (and the second such since 1994). These data have the potential to ground public health, public safety and public policy discussions about guns and gun transfers in what we assume is largely the legal firearms market, which is where firearms, even those that end up in the gray or black market, all start out.

APPENDIX

Table A1. Estimation of Gun Stock Using Gun Manufacturing Data

Year	Total Guns (Millions)	Δ	Adjusted Estimate (.99)	Year	Total Guns (Millions)	Δ	Adjusted Estimate (.99)
1899–1945	47			1980	168	6	140
1946	48	1	48	1981	173	5	144
1947	51	3	50	1982	178	5	147
1948	53	2	52	1983	182	4	150
1949	55	2	53	1984	186	4	152
1950	58	3	56	1985	191	5	156
1951	60	2	57	1986	194	3	157
1952	62	2	58	1987	198	4	160
1953	64	2	60	1988	203	5	163
1954	66	2	61	1989	209	6	167
1955	67	1	62	1990	213	4	170
1956	69	2	63	1991	217	4	172
1957	71	2	64	1992	223	6	176
1958	73	2	66	1993	231	8	182
1959	75	2	67	1994	238	7	188
1960	78	3	69	1995	243	5	191
1961	80	2	71	1996	247	4	193
1962	81	1	71	1997	252	5	196
1963	84	3	73	1998	256	4	198
1964	86	2	75	1999	261	5	201
1965	89	3	77	2000	265	4	203
1966	93	4	80	2001	270	5	206
1967	97	4	83	2002	274	4	208
1968	102	5	87	2003	279	5	211
1969	107	5	92	2004	284	5	214
1970	112	5	96	2005	289	5	217
1971	117	5	100	2006	295	6	220
1972	122	5	104	2007	301	6	224
1973	128	6	109	2008	308	7	229
1974	135	7	115	2009	316	8	235
1975	140	5	118	2010	325	9	241
1976	146	6	123	2011	334	9	248
1977	151	5	127	2012	347	13	258
1978	156	5	131	2013	363	16	272
1979	162	6	135				

Source: Authors' compilation based on Newton and Zimring 1968, Kleck 1991, and ATF 2015.

Note: We apply a 1 percent depreciation (permanent removal from use) rate to each year's adjusted stock. Pre-1969 figures do not appear to include import (and net out export) data.

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